

# CQ-TV

MAGAZINE  
No.147

**BRITISH AMATEUR TELEVISION CLUB**

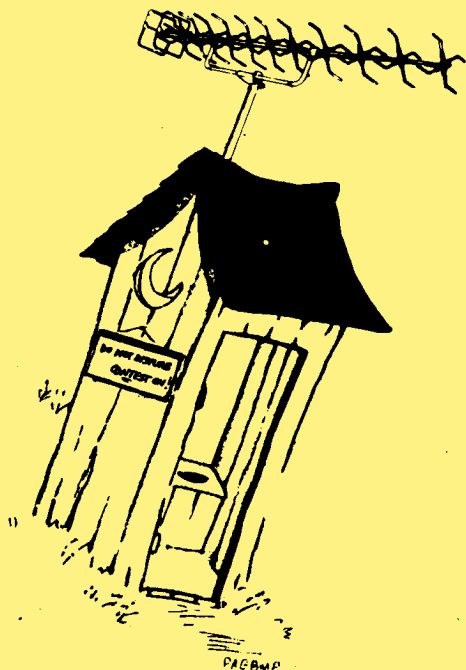
**AUGUST 1989**

INTERNATIONAL

AUTUMN VISION

SLOW SCAN

WINTER ATV



**CONTESTING?**

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## MEMBERSHIP

**FULL YEAR:** Subscription to the club is £6 per year. All subscriptions fall due on the first of January. Membership application forms are available by sending a stamped addressed envelope to Dave Lawton, whose address may be found on page-2 of this issue.

**OVERSEAS MEMBERS** are asked to send cheques bearing the name of the banker's London agent. Postage stamps are not acceptable as payment. Overseas airmail is extra - please enquire from Dave Lawton or see the rates list with your last subscription reminder form.

The British Amateur Television Club is affiliated to the Radio Society of Great Britain and has representatives on the committee of the European Amateur Television Working Group.

The BATC is registered under the DATA PROTECTION ACT - all queries to Dave Lawton, and VAT registered - number 468 3863 01.

CQ-TV is produced by the British Amateur Television Club as its official journal and is sent free to all members. It is not for general sale.

Articles contained in CQ-TV magazine may be quoted by non profit-making organisations without prior permission of the Editors, provided both the source and author are credited. Other organisations may obtain permission in writing from the Editor

The BATC maintains many pages of news and information associated with amateur television on the Prestel Information Service. Club pages may be found within the ClubSpot section and full details were last published in CQ-TV 134. Copies of the article (two pages) may be obtained from the Publications department.

Please note that any opinions expressed in this magazine are those of the writers, and do not necessarily reflect the opinions or official policy of the committee or the editor.

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CLOSE FOR PRESS FOR THE NEXT ISSUE ..... 20th SEPTEMBER 1989

# WHO TO WRITE TO

Members of the BATC committee are available to help and advise club members on any ATV related subject. Remember that all such work is done in spare time so please try to keep such queries to a minimum.

**CLUB AFFAIRS;** video tape library; technical queries, especially related to handbook projects: **TREVOR BROWN** G8CJS, 14 Stairfoot Close, Adel, Leeds LS16 8JR. Tel: (0532) 670115

**MEMBERS SERVICES** - PCB's; components; camera tubes; accessories etc. (other than publications); queries related to such supplies: **PETER DELANEY** G8KZG, 6 East View Close, Wargrave, Berkshire RG10 8BJ. Tel: (07352) 23121

**MEMBERSHIP** - Anything to do with membership including new applications; queries and information about new and existing membership; change of address; non-receipt of CQ-TV; subscriptions; membership records; data protection; Prestel: **DAVE LAWTON** G0ANO, 'Grenehurst', Pinewood Road, High Wycombe, Bucks HP12 4DD: Tel: (0494) 28899

**GENERAL CLUB CORRESPONDENCE & LIBRARY** - Any general club business. Queries relating to the borrowing or donation of written material. **PAUL MARSHALL** G8MJW, Fern House, Church Road, Harby, Nottinghamshire NG23 7ED: Tel: (0522) 703348

**PUBLICATIONS** - Anything related to the supply of BATC publications. **IAN PAWSON** G8IQU, 14 Lilac Avenue, Leicester LE5 1FN. Tel: (0533) 769425

**EXHIBITIONS AND RALLIES** - also arrangements and information about lectures and talks to clubs; demonstrations etc: **SITUATIONS VACANT** - any volunteers are asked to contact **PAUL MARSHALL**.

**CLUB LIAISON** - and anything of a 'political' nature; co-ordination of ATV repeater licences: **GRAHAM SHIRVILLE** G3VZV, The Hill Farm, Potts Grove, Milton Keynes, Bucks MK17 9HF. Tel: (0525) 25343

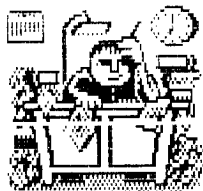
**TVI & RADIO INTERFERENCE** - problems of this nature to: **LES ROBOTHAM** G8KLH, 38 Ennerdale Avenue, Stanmore, Middx. HA7 2LD. Tel: (01 907) 4219 (not committee).

**CQ-TV MAGAZINE** - Anything destined for publication in CQ-TV magazine or forthcoming BATC publications. Articles; review items; advertisements; other material. **EDITOR: MIKE WOODING** G6IQM, 5 Ware Orchard, Barby, Nr. Rugby CV23 8UF Tel: (0788) 890365.

**CONTESTS** - **BOB PLATTS** G8OZP, 8 Station Road, Rolleston-on-Dove, Burton-on-Trent. Tel: 0283 813181.

**CQ-TV AWARD** - **BOB WEBB** G8VBA, 78 Station Road, Rolleston-on-Dove, Burton-on-Trent, Staffs, DE13 9AB. Tel: 0283 814582

Where possible it is better to telephone your query rather than write. Please do not call at unsocial hours. As a guide, try to call between 6.30 and 9.30pm evenings and not before 11am at weekends.



# POSTBAG

## OBITUARY

Dear Ed,

It is with regret that I have to inform you of the death in Australia of John Denny VK6NT, formerly G3NTT/T, on the 19th March 1989.

John, 'Tim' Healey and myself co-operated in a number of ATV projects and demonstrations, always trying to get more to join amateur television.

John also took part in Raynet and BARTG activities.

73 old friend,

Ron Bassett RS16075.

## F-CONNECTORS

*A note passed to me at the convention by an unknown author*

Dear Ed,

Some time ago somebody wrote into CQ-TV regarding information about 'decent' F-connectors. I have finally found a source of good quality connectors with real gold-plated centre pins. They can be obtained from:

Trompeter Electronics Inc  
W.L. "Hap" Gladish, WA6WPP  
31186 La Baya Drive  
Westlake Village  
California  
91362-4047, USA

Tel: (818) 707-2020

Fax: (818) 706-1040

The connectors are made to U.S. military specifications, and I am informed that the company is looking for a U.K. and European distributor.

## BBC GENLOCK

Dear Ed,

Is there anyone out there who has built and tried the BBC computer genlock circuit by Mr. J. Wike of Caerphilly, featured in G8PTH's ATV on the air column in R&EW April 1985? Since the DHSS do not pay me enough to afford a commercial unit, I wish to try this circuit and would like to know of any members' successes or failures with this. Yours faithfully,  
M. Butler G8KTX, 7 Bassett Road, Coundon, Coventry, CV6 1LF.

## PHONE NUMBERS

Dear Ed,

after reading an appeal for help in the last magazine I rushed to my 'library' to get the necessary information about a 'scope tube. Having found the info I rechecked the mag, only to find no telephone number given. So, I contact directory enquiries only to find that the number is ex-directory!

The moral of this story is, if you appeal for information and/or help through the magazine, give your telephone number as well. Many people are more than willing to phone such assistance to another, but when it comes to writing, that is altogether something else!

Yours Gary Tysoe, G8FWI.

## SPECTRUM SATELLITE TRACKING?

Dear Ed,

I have a Spectrum+2 and I would like to know whether any members have any ideas about interfacing it to a servo motor controlled motor to track a satellite. If anyone knows of a program to complete this task I would be more than grateful.

Yours, C. Perara, Airwork Ltd,  
PO Box 1223, Seeb Airport, OMAN.

### CROWDING ON 2M

Dear Mike,

I read with interest the letter you published from Peter G1CIE in CQ-TV 145 and your reply.

The problems of finding a free frequency to QSY to during contests is well known, what may surprise people is that the FM talkback is now the weak link. During contests we have actually seen numbers, but have been unable to contact the stations on 2 metres. Thus the TV contests are not reaching their full potential in terms of the number of contacts achieved.

There is a simple answer to these two problems however. Change to SSB for the talk-back, lots of room to QSY to and a large advantage in effective range. Also, 144.170 is the contest calling frequency that is already used across Europe. It is also likely that the high power hill-top stations will be able to make contact with lower powered home stations, and at least achieve a one-way vision exchange.

Obviously not everyone has SSB capability, so 144.750 FM will still play some part in the contests. I think, however, that the BATC should consider writing the use of SSB into the contest operating guide.

In short: 144.750 FM for NON contest talk-back, 144.170 SSB for contest talk-back.

Yours, Andy Brooker, G4WGZ.

### WHAT CONVENTION?

Dear Mike,

whatever happened to the BATC convention?

If it was not for the lectures it was like any other amateur rally, with little going on this year in the way of true demonstrations of various aspects of our hobby.

I can make only one or two exceptions to the above comments

with dedicated groups demonstrating equipment.

We attended both last year's venue and this year's, and as a family we enjoyed last year's event more, as there seemed far more interesting events/demos going on.

One side I am interested in is old hat now - SSTV, but in the four hours we spent at the event no Robot reared its head (perhaps it had gone for a walk!).

Perhaps more effort can be made next year to make the next convention more interesting as, although my views may not reflect what perhaps most felt towards the rally, I am sure many of your readers on reflection could feel a little let down by the highlight of this year's convention.

Yours, P.Bruce

*I could go on for hours about this letter and some that other committee members have received in a similar vein. For my answer see the Editorial!*

## NEWS ROUNDUP

### BATC CONSTITUTION

As part of the modernisation of the club procedures the committee is updating the Constitution of the British Amateur Television Club. If you would like to take part in this the committee would appreciate your views. Please write to:

Brian Summers, Hon. Treasurer,  
29 Perivale Grange, Perivale  
Lane, Greenford, Middx, UB6 8TN.

If you enclose an A4 SAE to Brian he will send you a copy of the proposed Constitution. It is planned to vote on the new Constitution at the next general meeting of the club in the spring of 1990.

### RATC PACKET ADDRESSES

After a forgotten request from Dave G8TVW to include this information in the last issue, below are the revised packet addresses for contacting the club.

Mike Wooding G6IQM Editor (yes me!)..... G6IQM @ GB7NUN-2  
(this is a change of BBS from that originally stated)

Graham Shirville G3VZV  
Liason..... G3VZV @ GB7HQQ.

Alternatively you may leave messages on my PMS..... G6IQM-7  
(local node DV7 at Daventry).

### PLANNING PERMISSION!

*This news item has been taken from an article in the Times on Dec 15th last year.*

Television viewers may not use more than one satellite dish unless they obtain planning permission, the Government confirmed late last year.

The clause in the Town and Country Planning general Development Order, 1977, could have disastrous consequences for British Satellite Broadcasting, which plans to launch three new satellite channels seven months after Sky Television.

Viewers who buy a dish to receive programmes from the 16-channel Astra satellite WILL NEED PLANNING PERMISSION if they want to set up a separate dish to receive BSB programming (or signals from any other satellite).

Anyone using a second dish illegally could be fined up to £2000, plus £200 for every day the second dish remains.

The act was updated in October 1988 although officials decided to leave the dish clause unchanged, the Department of the Environment disclosed.

Some councils in the North of England, where bigger dishes may

be needed, have prepared strict guidelines on the consent of planning permission.

BSB's comments after the release of this information was that the planning rules were a good reason why people should wait and see before rushing to buy any dish.

### COMPONENT SUPPLIERS CONT.

After publishing the list of component suppliers in the last issue I received information concerning another general supplier of electronic components. Write to the address below for a catalogue:

J.R.Hartley,  
Electronic Components,  
78b High Street,  
Bridgnorth,  
Salop, WV16 4DY

Tel: Bridgnorth (07462) 3865

### DISH LICENCE CHANGE

Statutory Instrument No. 123 published by the Government on 27th February last enforced the following change to the TV licencing regulations.

Reception of TV pictures from authorised ground stations (such as BBC, ITV or foreign stations) and some space stations (such as BSB) which operate in the frequency bands allocated to broadcasting, still requires a TV licence. The special £10 television receive-only (TVRO) satellite dish licences are ABOLISHED.

Receiving TV signals from satellites which operate outside the authorised bands, such as Intelsat, Eutelsat and Astra, does not now require a licence. Because they transmit outside the authorised broadcast bands they are not classified as 'authorised'; hence you don't need a licence.

### MORE LICENCE INFO

As from April this year there is no need for licences for a wide range of low-power radio devices, such as garage door openers, certain types of burglar alarms, industrial remote control equipment, radio microphones, low-power microwave devices and children's 'walkie-talkies'.

The exempted categories are set out in an information sheet that is available from: DTI Radiocommunications Division Library, Room 605, Waterloo Bridge House, Waterloo Road, London SE1 8UA.

### LOW-COST GaAsFETS

Avantek has introduced a new low cost, low-noise GaAsFET suitable for C and Ku band earth station preamplifiers and other microwave applications. Designated AFT-13284 the transistor is useful as a low-noise amplifier over the 2 to 16GHz range, and as an oscillator at up to 25GHz. It has a noise figure of 0.7dB with 15dB associated gain at 4GHz, 1.6dB with 8dB gain at 12GHz.

Data sheets are available from Avantek distributors, or direct from: Avantek, M/S M82, 481 Cottonwood Drive, Milpitas CA95035, USA.

### IARU REGION 1 CONFERENCE

Graham Shirville G8VZV, the club's liaison man, will be attending the IARU Region 1 conference next year in Spain.

Ostensibly Graham is attending as part of the RSGB delegation, but he will of course be maintaining the interests of the BATC and ATV'ers uppermost. To that end he will be placing a paper before the conference dealing with the 'Proposed Standard for FM Transmission in the Microwave band'.

This paper is based on the detailed investigation by John Wood G3YQC into FM television. It is hoped that it will form the basis of amateur activity in the microwave bands, not only in ATV but in all modes.

### SEVERNSIDE TV GROUP

News reaches us from the bristol mob via their P5 newsletter. It appears that the group now have a Chairperson, in the person of Her! For those of you not familiar with who Her refers to, it is in fact Viv G1IXE. We would like to wish Viv success in her reign as Chairperson of the group.

More news concerning the group's repeater GB3ZZ, is that they are now running a BBC based control system. Also they are experimenting with a new aerial setup using an array of yagis. The intention is to allow a station working through the repeater to remotely switch the box from its Alford slot receive aerial to the yagi with the nearest reciprocal heading. We await with interest news of the results.

### NEW REPEATERS

Two new repeater groups have been formed in Norfolk and South Dorset. Both groups have made investigative approaches to the RSGB repeater committee concerning requirements for licences etc. We wish both groups success.

One of the most exciting new ventures in television repeaters has been granted a licence and should be operational by late summer. This is GB3TG the 10GHz gateway into GB3TV. Intentionally provided to give cover to a shadow in the coverage area of 'TV in the Milton Keynes area, this repeater link will be a first and we await operational reports and perhaps a technical review in the near future.



### COMPONENT SUPPLIES

Rapid Electronics, listed in the component suppliers directory in CQ-TV 146 have moved. Their new address is: Rapid Electronics, Heckworth Close, Severalls Industrial Estate, Colchester, Essex, CO4 4TB. Tel: 0206 751166.

### MEMBERS' SERVICES

BATC Members' Services does not hold stocks of BATC publications and vice versa. Please note that only the items listed in the CURRENT 'Services For Members' supplement are available - a description of most of the various PCB's and components can be found in CQ-TV 140 onwards.

To avoid delay and inconvenience please be careful to include the correct amount of VAT with your order, ie: 15% of total goods AND postage, unless an overseas member. Payment should be by cheque or crossed postal orders only in favour of the BATC - do not send cash or postage stamps please.

Batches of callsign badges are sent to the engravers once per magazine cycle. please ensure that your order reaches Members' Services by the CQ-TV close date found at the bottom of the contents page in each issue. Badges are distributed to members as soon as they have been engraved.

### TWO SPECIAL OFFERS

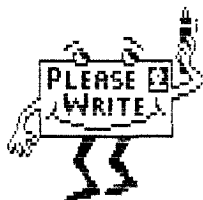
Members' Services are able to make two special offers in this issue. The first is printed circuit boards at half price or less! If you think you may have a need for the items available (see Market Place section at the end of the magazine) then buy NOW at a discount. These boards will not be available again once the sale stock has gone!

The second offer is for a rather special IC. Those of you who have not read the NEW 'Amateur Television Compendium' (and if not, why not?) will have seen the analogue-to-digital video converter, and back again, IC's used. The club has secured a limited quantity of the UVC3120-08 variant at a VERY attractive price. (Just look up the price of the one-way A/D video speed IC's!!). Details are on the Members' Services order form in the supplement.

The order form also includes many new PCB's for circuits featured in the ATV Compendium, which are now available. Further items will be announced in CQ-TV as and when they are available.

### VIDICONS

The club has now arranged for an additional source of vidicons to be available through Members' Services. Tubes available include electrostatic focus or deflection, and low-light types not previously available to club members. Prices vary depending on the size, type and grade of tube. Please contact Members' Services for information on equivalents, price and delivery times. The stripe filter tubes used in domestic type colour cameras are not available through the BATC, and normally must be ordered direct from equipment suppliers.



# EDITORIAL

It seems but a short time ago that I was writing the last editorial, which is about the last thing I do before actually compiling the magazine. Here we are now having had a glorious May and are now towards the end of *flaming* June.

The last quarter was, of course, quite eventful for the club, with the main social event for the year, the convention, taking place. This year's event was, as far as I am concerned, a great success, and a review of it follows in this magazine. Much of the comment that I have received from club members and show visitors was also complimentary. However, I have received a couple of letters of complaint, as has Trevor Brown, our chairman and convention organiser. As an example of the general content of the letters I have published the one I received from P. Bruce in the Editor's Postbag.

In his letter Mr. Bruce complains: 'whatever happened to the BATC convention? If it was not for the lectures it was like any other amateur rally, with little going on this year in the way of true demonstrations of various aspects of our hobby.' Initially my thoughts on this comment was that if you, the membership, is not willing to put on displays of your equipment etc, then it won't happen. You cannot expect the band of 22 (the committee for the uninitiated) to do it all, my appeals for volunteers in the magazine brought us the grand total of ZERO...THANK YOU!

However, on reflection, it occurred to me that there was rather a lot in the way of demonstration going on after all. The foyer, apart from the bring-and-buy stall and a couple of traders, was full of special interest groups demonstrating their particular fields, repeater groups demonstrating their repeater systems etc, the 405-group, the 3cm surgery with Bob Platts demonstrating and giving advice on 3cm ATV, etc, etc. If that wasn't 'demonstrations of various aspects of our hobby', then I don't know what is!

OK I hear some say. What about the helicopter, what about the live ATV stations, what about equipment past and present displays, etc, etc. I have as much idea as to where they were as you do. The committee does not personally own ALL the equipment that you may have seen on demonstration in the past, YOU DO! Therefore, if you want to see these particular demonstrations at future conventions get in touch with ANY committee member when you read the advance notices in CQ-TV and he will advise you exactly who to contact to arrange it.

It has been said before, and I dare say it will be said again, please do not leave it just to your committee. The club is what you the membership make it. We, the officers of the club and the committee, are only here to administer the club, and to act upon the membership's requirements. The demonstrating of ATV etc at conventions is not really covered by that brief! If you want it and it wasn't available at this year's event, bring it yourself next year.

Finally on this subject Mr. Bruce also says: 'Perhaps more effort can be made next year to make the next convention more interesting...'. This year having been closely involved with the organisation of the event with Trevor I can vouch for the time spent in organisation. I personally spent a total of several hours on the telephone, more hours

writing letters, and a few hours visiting the site. On the Saturday night before the event several of us spent several hours setting up the 'studio', where the BATC film was to be shot. This not inconsiderable amount of time was of course fitted into my timetable of producing the magazine. Trevor's time was fitted into his other duties as chairman. We both, as do the rest of the committee, have families and jobs to fit in in our spare time! I freely admit that I do all this through enjoyment but, this notwithstanding, there are times when I, if not others of the committee, could do with some volunteer support.

I make no apologies for my tirade which, on this occasion, represents the feelings of the committee. I do apologise to Mr. Bruce for using his letter as the example against which to direct my comments, please feel free to write again with your thoughts on the above.

Another matter to set right now! In the editorial column in the last issue I commented on the attempt by an amateur organisation to scupper the re-introduction of amateur TV to Eire. What I did not make clear, and Paul EI7GM has asked me to clarify the point, is that it was a British amateur organisation that made, we are glad to say, the failed attempt.

#### ASTRA SCRAMBLING & PAY-AS-YOU-VIEW TV

SKY Television has announced that tests via the satellite have been completed using their 'VideoCrypt' (formerly 'Palcrypt') system, which will be used for their pay-TV services.

The method by which they, and it would appear that BSB and other TVRO operators also, intend to operate the system is by the use of smart cards. For the uninitiated, smart cards are a kind of yuppy credit card, containing within its credit card format a microprocessor, ROM and RAM. These cards will be programmed with the necessary information concerning the amount of pre-paid viewing units that the subscriber has pre-paid for.

This card will fit into a slot in the proposed decoder unit attached to the TVRO receiving system. Within the decoder a card reader will assess the amount of pre-paid viewing units. A non-volatile store inside the decoder will maintain a record of the viewing units used, and which particular channels have been subscribed to, and when the store reaches the limit on the smart card, off goes the decoder! No more Disney, sport or whatever you may have been watching.

Card pre-payment will probably be based on two principles; for a three-month period and/or for a specific number of 'viewing units'. Since the viewing units may not be used up at the end of the prescribed period they will be transferable to the next card.

The intended launch date for encryption of SKY channels is stated as being early-to-mid 1990 (at least they got going on time, so perhaps this time span is correct). From then on a decoder will be required to receive, as I understand it, the majority of SKY and ASTRA channels. The decoders are in licensed production already, and it is expected that they will cost around £80. The cost of the pay-as-you-view TV has not been released, but I reckon an average of around £12 per month will be favourite. One final point, the decoder for SKY and ASTRA will be no good for any other TVRO stations, including BSB.

THE BRITISH AMATEUR TELEVISION CLUB

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31 DECEMBER 1987

	<u>1988</u>	<u>1987</u>
<u>INCOME</u>		
Subscriptions	12744	13183
Members services	243	1642
Publications	742	1183
Advertising	703	907
Building Society interest	523	826
Bank interest	392	-
Miscellaneous	-	1
Exhibitions	1840	1430
Donations	62	99
Postages	433	191
	<hr/>	<hr/>
	17682	19462
 <u>Less:</u>		
 <u>EXPENDITURE</u>		
CQ.TV printing	7410	7297
CQ.TV postage	3229	3323
General office expenses	823	870
General postages	1155	465
RSGB affiliation fee	11	11
Committee members expenses	180	112
Exhibitions	1530	1176
Advertising	455	304
Insurance and awards	123	81
Depreciation	634	65
Miscellaneous expenses	299	198
Accountancy	185	165
Rally attendance	939	-
Account charges	13	-
	<hr/>	<hr/>
	16986	14067
	<hr/>	<hr/>
<u>EXCESS OF INCOME OVER EXPENDITURE FOR THE YEAR</u>	£ 696	£5395
	=====	=====

THE BRITISH AMATEUR TELEVISION CLUB

BALANCE SHEET AT 31 DECEMBER 1987

	<u>1988</u>	<u>1987</u>
<u>FIXED ASSETS</u>		
Office machinery		
Additions	634	65
<u>Less: Depreciation</u>	<u>634</u>	<u>65</u>
	-	-
<u>CURRENT ASSETS</u>		
Stocks- members services	3732	3335
publications	2046	2879
Midshires Building Society- deposit account	10408	14885
Lloyds Bank Plc- current account	5856	2735
postage account	-	380
investment account	10000	-
Cash in hand	<u>16</u>	<u>-</u>
	32058	24214
<u>Less:</u>		
<u>CURRENT LIABILITIES</u>		
Creditors and accrued charges	927	907
Subscriptions received in advance	<u>8599</u>	<u>1471</u>
	<u>9526</u>	<u>2378</u>
	£22532	£21836
	=====	=====
<u>Represented by:</u>		
<u>ACCUMULATED FUND</u>		
Balance brought forward	21836	16441
<u>Add:</u>		
Surplus of income over expenditure	<u>696</u>	<u>5395</u>
	£22532	£21836
	=====	=====

In accordance with instructions given to us, we have prepared these accounts from the accounting records of The British Amateur Television Club, and from information and explanations supplied to us.

*RNS Stone & Co*  
Chartered Accountants  
9 May 1989

# PRECISION MEASURING BOX

(One of the '89 Convention prizewinners)

Pete Carliell

This design for a level-measuring box is not meant to detract from previous good (or even Goode) ideas in CQ-TV. It is offered as a very accurate and easy yardstick by which (with an uncalibrated oscilloscope) your picture, syncs, burst, clipping levels etc can be measured. Most PAL coders can also be accurately lined up without a vectorscope. the principle is borrowed from the BBC 'Weaver Box', but the circuit is simpler and not a copy.

## THEORY

This device is meant to be used with an oscilloscope, when it provides a very quick and accurate means of measuring video signals in the range of 1 volt  $\pm 1\%$ . The design, though simple, took a lot of work, and both the circuit and component values should be strictly adhered to.

The measurement principle is to add to the video a squarewave, whose amplitude can be changed. This gives the effect on the

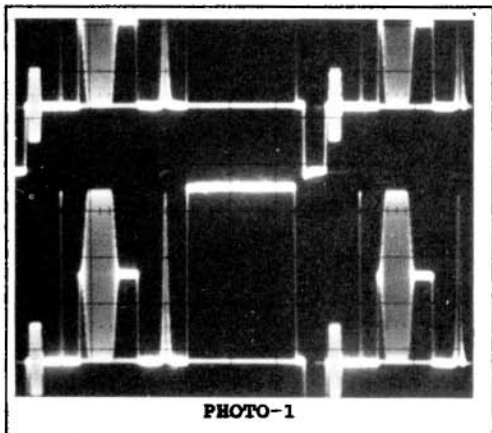


PHOTO-1

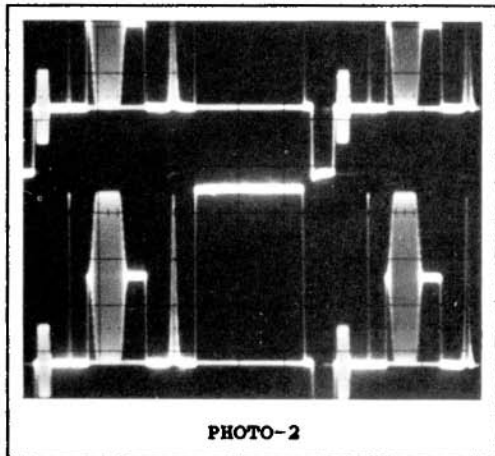
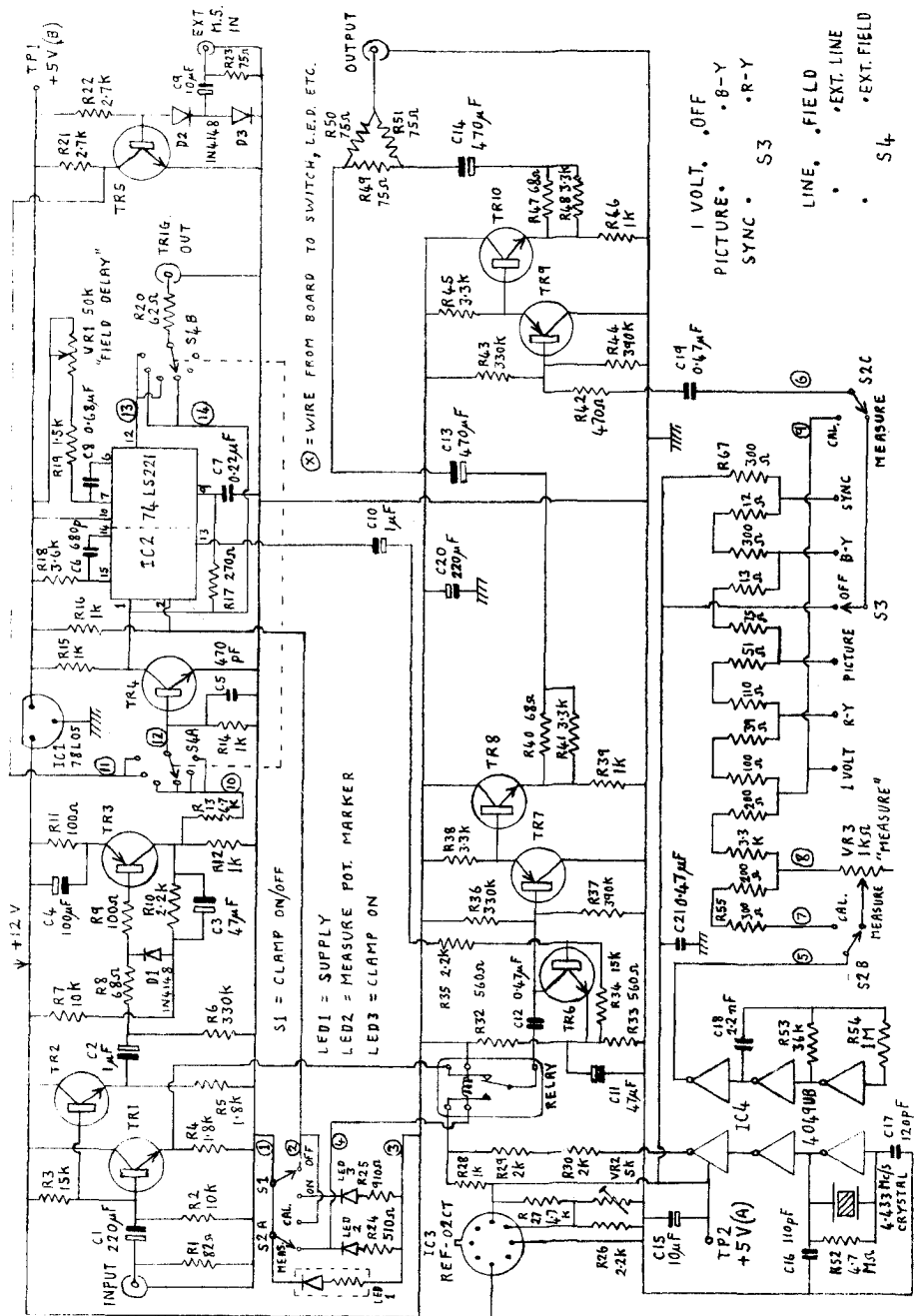


PHOTO-2

oscilloscope display of two traces, whose vertical separation can be varied, see photographs 1 & 2. the squarewave amplitude can be selected to measure 1 volt, picture (0.7V), syncs and burst (0.3V), or the B-Y and R-Y chrominance signals from a coder. (If any of our American friends want to build this unit to measure 100/40 picture/sync ratio and the I and Q, I would be happy to work out the new attenuator chain values). A calibrated fine adjustment on these amplitudes gives a direct reading of signal amplitude.

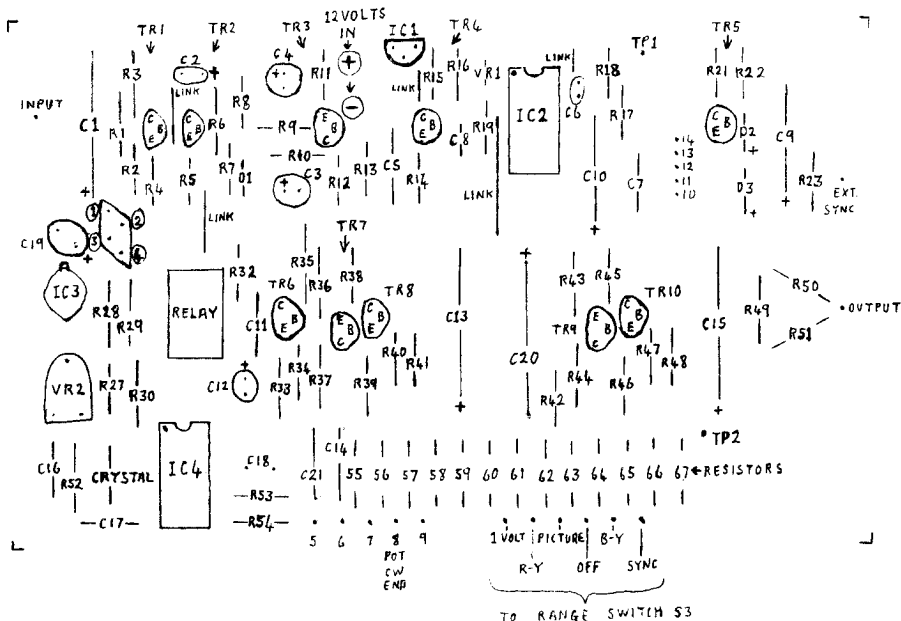


**Fig.1 Circuit Diagram.**

## DESIGN

The design has deliberately been kept as simple as possible, whilst achieving a good performance and is shown in Fig.1. The printed circuit layout and component overlay are shown in Fig's.2 and 3 respectively. To avoid errors in amplifier gain only unity-gain emitter follower stages are used. (The slight loss through an emitter follower is compensated for by trimming impedance-padding resistors). This means that after terminating and then buffering to 75-ohms there is a 6dB loss. Mixing with a squarewave would then give a signal of 1 volt overall, but the delta mixing pad gives a further 6dB loss. This is quite acceptable if an oscilloscope gain of 50mV per division is used.

Interference on the video can spoil the ease of using this device, particularly if the interference is of low frequency, e.g: hum. For high frequencies and noise making a switchable filter with exactly 0dB loss in-band is difficult and has not been attempted. To remove hum etc, a simple sync-tip clamp (TR6) is included to switch in on the rare occasions when it may be needed. Clamp pulses are only 2uS wide to avoid complications with equalising pulses. The clamp can however cope with about 150mV of hum. A low output impedance buffer (TR1) drives the clamp. Clamp capacitor C12 is a compromise between good clamp performance and adequate low-frequency response when not clamping. A buffer stage (TR7 and TR8) following the clamp provides a 75-ohm output.



**Fig.3 Component Overlay.**



The squarewave generator is an RC oscillator. Using CMOS gates the output can swing to virtually supply rails if lightly loaded, and when fed from an accurate supply (IC3) an accurate amplitude is obtained. Loading is minimised by using the TTL driver 4049UB, and as this can sink more current than it can source the attenuator chain is returned to +ve supply.

When the squarewave has been mixed with the video it is impossible to trigger the oscilloscope from the signal. A sync separator (cribbed from an article by John Goode) is included to provide an oscilloscope triggering signal. TR2 stops the separator distorting the sync tips of the input signal. External mixed syncs are also allowed for, and will be necessary for measuring non-composite signals. A simple integrator R17/C7 gives a field trigger that allows you to see the difference between hum and field distortion. IC2b is a variable monostable giving a -ve edge at field sync and a +ve edge adjustable throughout most of the field. By triggering from this edge you can select individual lines. This facility may be omitted or expanded, as the PC board allows for a sub-board which could pre-select particular lines. For example, if idents in the field interval were used.

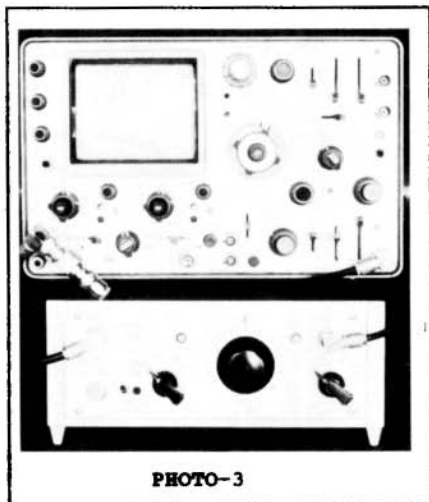


PHOTO-3

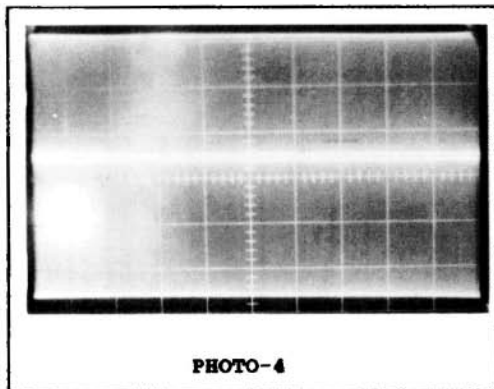


PHOTO-4

Any constructor fortunate enough to own a 150MHz Tektronix can terminate the box output with 75 ohms and assume that the oscilloscope's response is flat throughout the video bandwidth. Those of us with something less in the way of a 'scope may find the response at subcarrier frequency falling off. In view of this a calibrate function is included. A crystal oscillator is formed with one gate of the 4049. The crystal is at PAL subcarrier frequency but this is not critical. Component values are chosen for the best squarewave, which is double buffered to a constant amplitude. In the calibrate mode, 1 volt of subcarrier squarewave is switched in place of the input signal by the relay. Exactly 1 volt of measuring squarewave is selected with the 'Measure' potentiometer being replaced by 500-ohm fixed resistors. The output signal is now a mixture of LF and subcarrier, with an overall peak amplitude of around 0.5 volts. The result on a very good oscilloscope terminated in 75-ohms will be as shown in photograph-3.

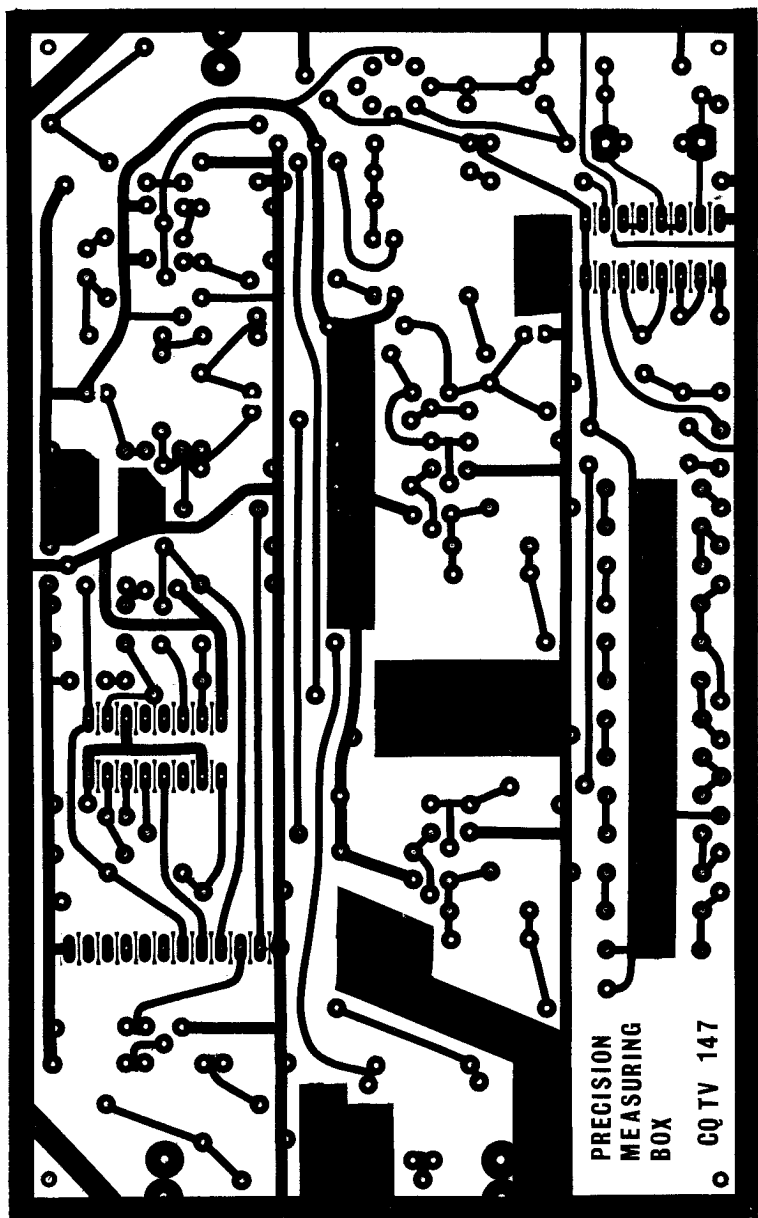


Fig. 2 Printed Circuit Layout  
(actual size).

If the display on your oscilloscope is more like photograph-4 (note the gap between the traces) then some correction will be necessary for colour measurements. a terminator such as shown in Fig.5 should be used.

## CONSTRUCTION

Construction should be easy using the purpose made PCB, although a prototype worked well On vero board. Component values should be followed exactly. The 1% resistors are essential and the 1k potentiometer should be of high quality. All the parts can be obtained from Maplin.

The function and clamp switches and LED's can be wired with a 16-way ribbon cable. Range and trigger switches are best wired with their own ribbons.



I made the calibrated knob dial (photograph-5) by starting with a yoghurt pot. The bottom of this gave a 1.75" circle of white plastic. I drilled a  $\frac{1}{8}$ " hole exactly in the centre and very lightly glued it to the back of a suitable large knob. The knob was then fitted to the potentiometer and the centre of rotation lightly marked on the plastic dial.

## ALIGNMENT

Setting up requires an accurate voltmeter to set the +5 volt (A) rail to +5.1V at TP2. This will set the squarewave out of IC4 to 5 volts in amplitude

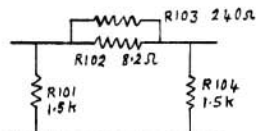
The measurement must now be calibrated at plus and minus 0.9dB. This equates to  $\pm 10\%$  as shown in table-1. Set the box to MEASURE, 1V and centre the potentiometer. Feed in a squarewave and set its amplitude to exactly 1 volt. Attenuate the input with the 0.9dB pad shown in Fig.4, and adjust the measure potentiometer to this level and mark this point on the dial. Re-centre the control and re-set the input level to bring the waveform to the level first noted without the pad in circuit. Remove the pad and adjust the measure control to this +0.9 level and

TABLE OF dB TO % DIFFERENCE			
dB	%	dB	%
-0.0	0	+0.0	0
-0.1	1	+0.1	1
-0.2	2	+0.2	2
-0.3	3	+0.3	4
-0.4	4	+0.4	5
-0.5	6	+0.5	6
-0.6	7	+0.6	7
-0.7	8	+0.7	8
-0.8	9	+0.8	10
-0.9	10	+0.9	11

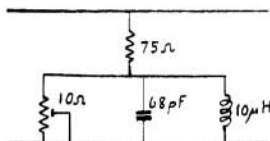
TABLE-1

again mark the dial. The dial can now be separated from the knob, marked out with Letraset or similar, and glued back in the same position. The numbers should be well varnished. If this sounds like too much hard work use a pointer knob and mark the front panel instead.

Fig.5 shows the circuit of a simple oscilloscope equaliser. Connect this in line with the input to the oscilloscope and, with the calibrate squarewave signal only, adjust the 10-ohm potentiometer for the best square wave response on the screen. This equaliser should be left in circuit unless the oscilloscope gives a good squarewave response without it.

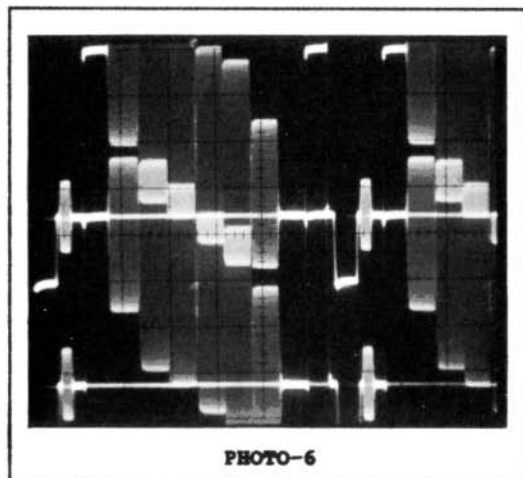


**Fig.4 Attenuator.**



**Fig.5 Oscilloscope Equaliser.**

Finally, an offer you can't refuse! If you are unable to borrow an accurate multimeter, or you would just like your box checked on a very accurate signal, send it to me. If you include the return postage I will even send it back!!!



Operating the box should be obvious. Line up the two traces, e.g: photograph-6, and read the signal amplitude from the dial. For many uses you will be setting the dial to 0dB and tweaking the signal source to match.

To line up a coder, feed it with black level and set carrier balances for no subcarrier (except burst). Now apply colour bars and set picture and sync levels and tweak white balance for no subcarrier. Switch the coder to B-Y and set it as in photograph-7. Switch to R-Y and set that as as shown in photograph-8. finally, set the burst on SYNC. Obviously this assumes that the coder has the appropriate switching.

## COMPONENTS LIST

### Variable Resistors

VR1	50k (Multiturn if possible).
VR2	5k Horiz. mounting pre-set.
VR3	1k Maplin "high power" cermet

### Capacitors

C1+20	220 $\mu$ F electrolytic axial
C2	1 $\mu$ F tantalum
C3+11	47 $\mu$ F electrolytic radial
C4	100 $\mu$ F electrolytic radial
C5	470pF polystyrene
C6	680pF ceramic
C7	0.22 $\mu$ F polyester
C8	0.68 $\mu$ F polyester
C9	10 $\mu$ F electrolytic axial
C10	1 $\mu$ F electrolytic axial
C12,19+21	0.47 $\mu$ F polyester
C13+14	470 $\mu$ F electrolytic axial
C15	10 $\mu$ F electrolytic radial
C16	110pF polystyrene
C17	120pF polystyrene
C18	2.2nF polyester

### Semiconductors

IC1	78L05
IC2	74LS221
IC3	REF-02CT (Maplin)
IC4	CD4049UB
TR1+2	BC109
TR3,7+9	2N3906
TR4,5,6,8+10	2N3904
LED 1	12V Pan. Plas. Mnt. Green (Maplin)
LED 2	Shape LED A5 Green (Maplin)
LED 3	Mini LED Red (3mm) +clip (Maplin)

Relay: Ultra Min. 12V S.P.D.T. (Maplin)

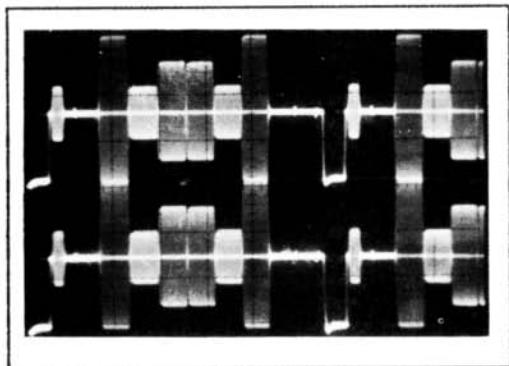
Crystal: 4.433Mc/S HC18U or HC25U

### Switches

S1	1P2W toggle
S2	4P2W toggle (Maplin)
S3+4	2P6W rotary wafer

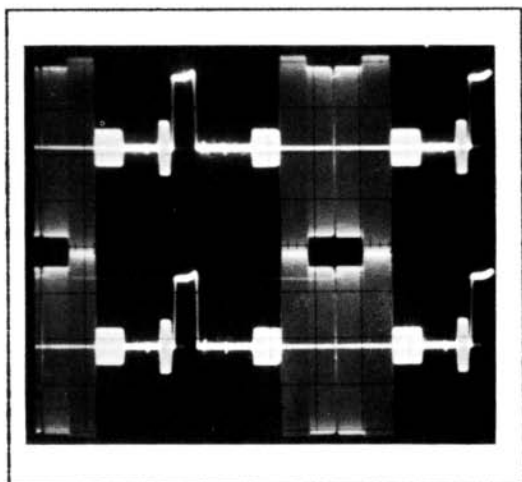
### Fixed Resistors

R1	82 $\Omega$ 1%
R2+7	10k
R3+34	15k
R4+5	1k8
R6,36+43	330k
R8	68 $\Omega$
R9+11	100 $\Omega$
R10,26+35	2k2
R12-16,39+46	1k
R17	270 $\Omega$
R18	3k6
R19	1k5
R20	62 $\Omega$
R21+22	2k7
R23,49,50, 51+63	75 $\Omega$ 1%
R24	510 $\Omega$
R25	910 $\Omega$
R27	4k7
R28	1k1%
R29+30	2k1%
R32+33	560 $\Omega$
R37+44	390k
R38,41,45+48	3k3
R40+47	68 $\Omega$ 1%
R42	470 $\Omega$
R52	4M7
R53	36k
R54	1M
R55,65+67	300 $\Omega$ 1%
R56+58	200 $\Omega$ 1%
R57	3k3 1%
R59	100 $\Omega$ 1%
R60	39 $\Omega$ 1%
R61	110 $\Omega$ 1%
R62	51 $\Omega$ 1%
R64	13 $\Omega$ 1%
R66	12 $\Omega$ 1%
There is no R31	
R101+104	1k5 1%
R102	8.2 $\Omega$ 1%
R103	240 $\Omega$ 1%



**PHOTO-7**  
**B-Y PATTERN FROM CODER**

**PHOTO-8**  
**R-Y PATTERN FROM CODER**



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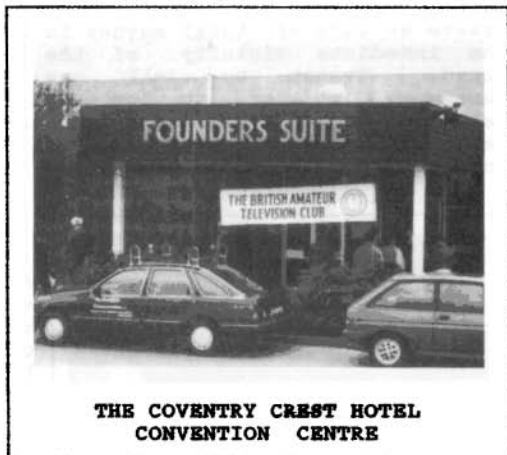
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# THE 1989 BATC SHOW

As those of you who went know, this year's BATC convention was held on a gloriously sunny Sunday 30th April at the Coventry Crest Hotel. To all of you that came, we hope that you enjoyed the event. To those that couldn't make it, commiserations, by way of a placebo below is a short resumé of the show.

The change of venue this year meant that the entire show was held inside one large hall, the hotel's Founders Suite. The attendance was again very high, with around 1500 people coming through the doors, and only a handful complaining about the small entry charge of 50p. This charge was necessitated by the committee's wish to hold the event within the constraints of the Sunday trading laws. The reason for the change of location, after several years at Crick, was due to the Post House's inability to house the show again, as they do not have a purpose-built convention centre.



One perhaps unnoticed advantage of the Crest Hotel, especially by those who arrived later, was the larger car park, although this was filled to capacity with many having to park on the verges etc. Probably the only real answer to this problem would be a location such as the NEC, but such expensive pie-in-the-sky dreams are not to be aired here! Let us not forget the parking problems at another of the midland's popular rallies, the Leicester show at the Granby Halls.



The talk-in station operating the call sign GB0TV, provided and manned by the Coventry Amateur Radio Society to whom we offer our grateful thanks, was to be found just inside the Coventry end of the hall in the foyer. They were kept quite busy for much of the day helping to guide those of you not familiar with the area and attempting to offer advice about parking. At the opposite end of the foyer and adjacent to the main doors was the BATC stand. Manned by various members of your committee the usual bustle of people was to be found, buying books, PCB's and seeking advice, or just having a natter!

In the centre of the foyer, which contained mostly club and special interest group stands, was the GB3RT Bring-and-Buy. Not much need be said about this area of the rally, other than that ably assisted by G6IKQ, G1GPE, G1KLG, G8ONX, G8MWR, G8NNG and G0HRM, yours truly managed once again to create an aura of total mayhem in the immediate vicinity of the stand. Thanks to all our customers whether buying or selling, once again you have helped keep the repeater alive for another year.



**G6IKQ WORKING HARD ON THE  
BRING-AND-BUY STALL**



**TOM MITCHELL AND DAVE LAWTON  
ON THE BATC STAND**

As previously mentioned, other special interest groups were to be found in the foyer. Bob Platts giving help and advice to all the budding 10GHz ATV'ers, Andy Enmmerson with the 405 group, the Severnside ATV group, the Narrow Band Group, the Worthing Repeater Group and the Home Counties Group. All these stands having demonstrations and exhibits to be seen and discussed, as well as selling their wares to fund their specialist projects, repeaters etc.

In the main hall trade seemed to be brisk, although with the aisles between the stalls being very crowded much of the time it was not easy to see who was buying what! There was a forest of aerials at one end of the hall that made the temporary mast for the talk-in station seem decidedly unpopulated.

This aerial farm purported to belong to the Dee-Comme stand, who reported brisk interest in their wares. Micromax were again present at the show, with a stand full of 23/24cm aerials and PA's, test gear and general bits and pieces for ATV constructors.

Having purchased your new aerial array, a trip to the Barenco stand would provide you with a wealth of choice of mast fittings, poles, lashing kits, clamps, brackets, and above all plenty of good advice.





A good selection of components was available on the Wiermead and Bonex stands, catering for all the constructors amongst you. For the more adventurous, various stalls featured an 'interesting' range of surplus pieces of gear, circuit boards and all the necessary bits and pieces for refilling the shack junk box.

A new product that created a lot of interest was Camtech's new 24cm ATV transmitter, unveiled for the first time at the show.



Watch future issues of CQ-TV for a full review of this new unit, which uses the latest state-of-the-art techniques involving surface mount components, producing a very compact transmitter.

Outside the hotel in the car park, the usual somewhat impromptu car boot sale took place, with members offering all sorts of gear at bargain prices. However, the main event in the car park and grassed areas appeared to be picknicking in the glorious sunshine. I for one would have been glad to join them!



**THE BATC FILM CREW  
ATTENBOROUGH WATCH OUT!**

An event taking place in a separate room of the hotel during the morning (and some considerable time the night before I seem to remember) was filming for the club's video production to be released some time in the future. The professional TV men amongst the committee huddled together in the makeshift studio and, with Graham Shirville looking extremely celubrious in his whistle and flute in front of the camera, many feet of video were shot via the hired camera. I hope to bring you further details of this epic production in the near future.

All in all the event was a great success. Obviously we cannot provide an event to please all of the people all of the time, but having been more closely involved with the organisation of this years event, and thus understanding many of the problems encountered, I feel that we can be justly pleased with the outcome. Finally, on behalf of the committee and the club, I would like to offer a vote of thanks to Trevor Brown, our Chairman and Convention organiser, for his time and efforts for this event.



**CHAIRMAN TREVOR, JUST WHAT  
WAS HE DOING WITH G1GPE?**

# A LETTER FROM OUR FOUNDER

*In the last issue of the magazine I published a letter from one of our very early members, Arthur Critchley. In his letter Arthur mentioned his association with the club's founder, Mike Barlow. Mike has written to me detailing his involvement with the club in its early days, and with a resumé of his interesting life. It is with great pleasure that I include his letter, and I hope that you find it as interesting and amusing as I did.*

In CQ-TV 146 Arthur Critchley and John Wood wrote about some of the early days of the Club, and as I am about to retire from the CBC having spent my entire professional life in Television, mainly as a result of my BATC interest, perhaps you'll allow me to add a few words.

Looking back it is easy to forget the shortages of the most elementary items back in 1949. Not so much technical equipment, for the surplus radio shops were beginning to fill with ex-WWII stuff, but the necessities for turning out a newsletter - paper, stencils and ink. I don't know why anyone would want to read the early editions of "CQ-TV", except for historical interest, but the first couple are almost illegible, being typed on my mother's vintage typewriter with a 20-yr old ribbon. We even tried re-inking the ribbon with rubber-stamp ink, with disastrous and messy results.

My parents somehow found a new typewriter as a birthday gift, but that didn't solve the problem of the hand-worked duplicator. This used waxed stencils which you typed by switching out the ribbon in the typewriter. You could draw with a pointed instrument, but I have never been a draftsman and those circuit diagrams etc prove it. They were AWFUL! Every sheet had to be individually inked and printed, so to some extent the small membership of 25 or so was a Godsend.

An early necessary improvement was to buy pre-printed covers, which we did with £6, and we managed to find a rotary printer for the stencils, but a reasonable printing job wasn't done until issue-20, when we went to the present size of publication. Again this was a matter of availability - offset Rotaprint presses could take camera-ready paste-ups by 1950 and turn out a few hundred copies at a price we could afford.

The camera-ready bit meant we could get proper drawings made or copied, cut and paste, etc, just as you can now do at vast expense with a computer. However, as the quality went up so did the membership, and we should not forget the many people who more or less willingly helped with the mailing chores.

My own interest in amateur radio had been sparked (ouch!) by my uncle who had dug out an early 1920s crystal set for me just before the war. A neighbour also had one of the first TV sets in 1937 or so, vertical CRT and mirror, but I don't remember being particularly impressed. I had built a TRF mains receiver (4 volt heaters) in 1939, but for the war I was limited to F.J.Camm's radio books which my mother would buy for me every time I went to the dentist! I had an RSGB handbook too.

When the war ended I was at school in the Isle of Man, and to fill in time before being called up for the Army I joined nearly all the

school clubs, getting an early dose of photography and stage lighting which served me well in my subsequent career in Show Biz (that's what TV engineering is, you know).

During a trip to Smith's of Edgware Rd (are they still there?) to look at the latest Army Surplus stuff, I met Don Bradford, an enthusiastic SWL living in Denham, close to my home in Gerrards Cross. He had built a VCR97 TV, and opened my eyes to the possibilities of do-it-yourself TV. With his enthusiastic support I took my Morse test in the I-o-M and became GD3CVO at school and G3CVO at home. In turn, Don took out his licence as G3GB0, and became very active on VHF for many years until he emigrated to Kenya; he was unfortunately killed in a flying accident some years later.

My 22 months of National Service at Catterick as a Radio Mechanic instructor included the No 10 set, an early pulse-modulation multichannel microwave system, using hundreds of EF50 valves. This gave me a useful grounding in pulse techniques. It was also so specialised that I was able to avoid wearing boots, doing guard duties, and generally anything very "Army". Many of the other staff were hams and/or ex GPO engineers, and if the Army got uppish we were able to restore things to normal by simply reducing the output of trained radio Mechanics by one or two a week - quite enough to clobber the entire British Army at that time.

On another trip to Lisle St I met Tony Sale, who then lived near High Wycombe, about 15 miles away from me. With no cars, Don and Tony were inaccessible except by telephone, of course. Tony had completed a six foot working robot, and was taking a job at Marconi's at Chelmsford. You can read about his subsequent career in Peter Wright's "Spycatcher"; that's our Tony all over.

Tony and Don gave me much of the push into amateur TV, and one day we decided to go and visit Ivan Howard in the tiny village of Stotfold, about 40 miles away. We had read that he had a 5527 Iconoscope, probably the only one in Britain (I never did find out how it was smuggled in without the then-necessary permit) and had made a TV camera. (Remember that about this time there was ONE TV channel broadcasting from about 6.30pm to 11pm, but with endless Test Patterns all day).

Anyway, Ivan owned a small radio and TV shop in Stotfold, so I persuaded my mother to give up her petrol ration and her BSA car so that we could make the trip. With petrol rationing being what it was, I had never driven the car more than five miles, so when it got very hot and smelly after about 25 miles, I thought that was natural. When the transmission burnt out for lack of oil we found out better! However, by diverting to train and bus we finally got to the Stotfold village hall to see Ivan's demo to the Womens Institute or whatever.

Ivan brought the camera in a perambulator, and this was the occasion of the famous interview with the local constable, after the show at about 1 am "Ullo, 'ullo, 'ullo!" says The Law. "What've you got in that there pram then?". "Oh, it's a Television Camera, constable" says our Ivan. Now if he'd said the Crown Jewels it would have been just as likely at that time, and Ivan had quite a time of it.

After the Army I went to Cambridge, where I got into trouble for suggesting that the ARRL Handbook should be in the Engineering Library

("Mr Barlow, we're training THEORETICAL engineers here, not PRACTICAL ones") and learnt how to Saw a Lady in Half with the Magicians Club.

Next was the matter of a job, and I was all set to go to Standard Telephones when Tony Sale pulled some strings and got me a second interview with Marconi's at Chelmsford. I joined them to sell Aeronautical Communications equipment, and after a year in the Marconi College came out to do Television Transmitter modulator development, working on the Crystal Palace and early ITA transmitters. That was where I met Don Reid, who was a dab hand at parties with remote controlled (small) explosive charges.

By the way, choosing a job is often difficult when you have no experience to go on. One of my interviewers gave me a useful tip I've used myself when asked for advice. He told me to think about whether I wanted to design what goes into a Black Box, or to be the chap who uses the Black Boxes to do something. I chose the latter and have been very happy in my career.

Cycling in to work one day, I realised that the very elderly and rusty bicycle next to mine was owned by the Chief Research Engineer. I thought that if the CRE could only afford a bike like that, maybe I was in the wrong company. Also, the fact that there were an enormous number of very clever people at Marconi, all of whom I'd need to surpass, plus the general malaise in Britain at that time, decided me to try Canada.

Marconi's were kind enough to give me some special training on Mk III cameras and on how to make Image Orthicons, and fixed me up with a job with Canadian Marconi in Montreal. This was fine professionally, but the different culture and geography put amateur radio and TV out of the way - I could get my fill of TV at work. Photography and 8mm films took my fancy, and remained so until ousted by computers and, lately, Ciphers and Codes.

I subsequently joined the CBC, and have thoroughly enjoyed my life as a "reasonably sized fish in a reasonably sized bowl". If you pick your company size correctly, and the will is there, you can tackle anything you like, so that work is never a bore.

I've also continued to be interested in spreading the word, being or having been editor or publisher of numerous newsletters, and author of numerous articles and reports. After all, if it's good, you should tell someone about it to record it for posterity, and if it's no good you should tell them so they can avoid that particular red herring.

Currently I'm editing the Computer Supplement of the American Cryptogram Association. The magazine has a circulation of 250, has 24 pages done by Xerox, and is put into envelopes by more or less willing volunteers. If I add that it has a "What The Other Guy Is Doing" section, you'll feel right at home.

The BATC has done a lot for me; I'm glad to have helped start something that may have been good for you too.

Mike Barlow.

*PS. The 720k format for the disc was just right Mike, I managed to read the text file etc. without problem. Thanks again, Mike G6IQM.*

# *THE NEW BATC HANDBOOK!*

## **THE ATV COMPENDIUM**

Mike Wooding, G6IQM



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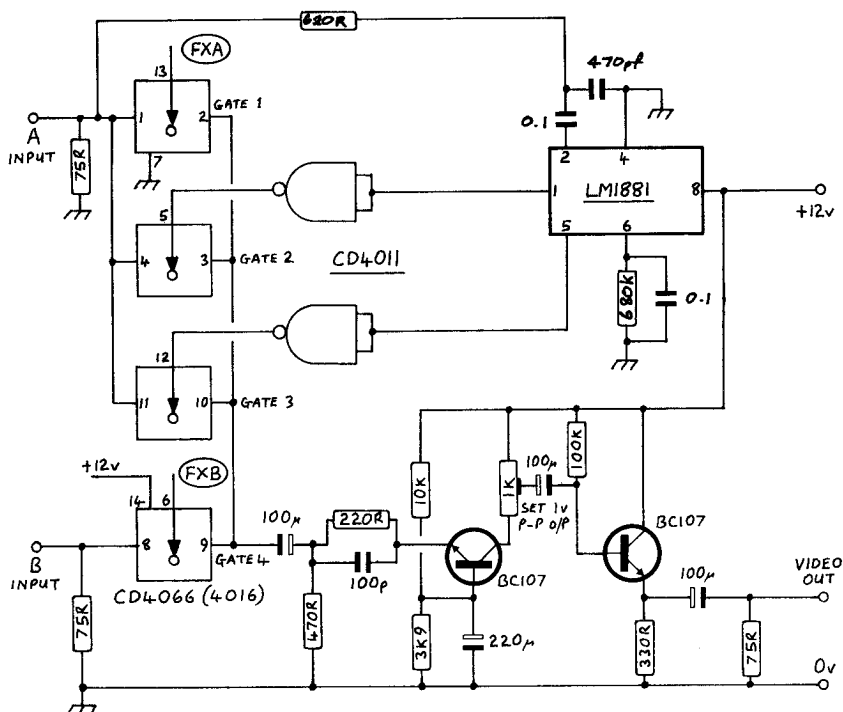
# A VIDEO MIXER/SWITCHER

Eric Edwards GW8LJJ

A local ATV'er wanted a simple video mixer/switcher unit which could also be used at a later date to produce video effects (FX) - so could I help? Thus, being the trustworthy friend (as explained to the XYL) and anyway it got me out of gardening, I decided to produce a design from the IC's that I had in the junk box. I had an abundant supply of 4066's and the odd LM1881 - the following was the result:

A two-channel mixer that fades to black, thereby maintaining colour information. A colour camera (or input-A and provides the reference can be from any other source, B&W or colour. If no video source is connected to input-B, switching to this channel will produce fade to black (and burst).

The unit also features a video amplifier to buffer the output and ensure that the output video signal can be maintained at 1 volt p-p. A potentiometer is provided to set the output level.



**Fig.1 Video Mixer/Switcher.**

## IN THEORY

The circuit diagram of the mixer is shown in Fig.1. A colour video signal (colour camera, VCR, etc.) is fed at all times into input-A. This signal is routed into the inputs (pins-1, 4 and 11) of three gates of a 4066 (4016) Quad Bilateral Switch IC, the outputs of which are all joined together (pins-2, 3 and 10). Gate-1 allows the video signal at input-A to pass when FX-A (pin-13) is high, which can be by application of a maximum of +12V. The video signal at input-B is inhibited by Gate-4 being switched off by applying a low at FX-B (pin-6).

When the switching conditions are reversed by applying a low at FX-A and a high at FX-B, the video signal at input-B is routed through. However, a permanent feed of input-A is routed to the LM1881 Sync Separator IC. The negative-going mixed sync output from pin-1 of the LM1881 is fed to Gate-2 via an inverter. Thus, during the sync intervals of the video waveform at input-A, gate-2 will be switched through, presenting mixed syncs from input-A at the output. Similarly, if the video signal at input-A is faded the colour burst from pin-5 of the LM1881 switches gate-3, thus providing black and burst to maintain the following circuits in sync.

## IN PRACTICE

A composite colour signal must be applied to input-A at all times. This can be from a colour camera, colour pattern generator or video recorder. Input-B can have any locked signal applied, this can be a fully synchronised colour camera, pattern generator, or genlocked black and white camera. Ideally, the video signal at input-B should be non-composite and at the correct level of 0.7 volts. The sync pulses and, if input-B is fed with a colour signal, the burst are sourced from the signal at input-A via the LM1881 as described above.

A high on FX-A control input and a low on FX-B control input will switch the video signal at input-A through and inhibit the signal at input-B. A reversal of the control input conditions causes input-A to be inhibited and input-B to be switched through.

Some interesting special effects can be generated using this circuit. For example: by using variable voltages on the control inputs fades can be produced between the inputs, a rising voltage on one control input and the complementary falling voltage on the other. Alternatively, by feeding the control inputs with complementary line or frame rate waveforms, horizontal or vertical wipes respectively can be produced.

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# **SSTV FREQUENCY - 144.5MHZ**

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# TV ON THE AIR

Andy Emerson G8PTH

Welcome again to the wide world of ATV activity, with news from far and near. Most, though, is from far - so how about a bit more input from Great Britain?!? As I write these notes we are in our third week of really lovely weather - ideal for portable and contest working, and most unseasonal. Despite the clarion calls of gardening, house painting and barbeques, I am sure you are all devoting your spare time to what really matters...

## INTERNATIONAL CONTACTS

No, not on the air this time, but in a figurative sense. I have often stressed the advantage of building bridges with ATV'ers overseas and building our ATV hobby into a world-wide organisation. Only our AMSAT friends have really achieved this so far, and it is high time we built up something similar. With this in mind, I am delighted that we had an American visitor to our (almost too) successful BATC convention this year.

Our guest was Henry Ruh KB9FO, who apart from being a high-profile ATV'er in the States, is also publisher of 'ATV Quarterly', the USA's equivalent of 'CQ-TV'. Henry appeared to be suitably impressed with the way we do things over here, and returned to Chicago laden with plenty of video plunder. He says he will be back (is this a threat or a promise?!?) and accompanied by several other ATV'ers, if we can only arrange that our convention no longer clashes with the Dayton Hamvention. Yes, indeed - we were thinking along similar lines as well.

Incidentally, 'ATV Quarterly' is a very good read, full of technical goodies in its large colour format. You can subscribe by writing to the UK agent, Mike Wooding (5 Ware orchard, Barby, RUGBY, Warks., CV23 8UF). A SAE will get you details, while £2 will buy you the latest issue.

## REPEATER NEWS

The fine weather during May led to some impressive ducting, and tempted Richard G4YTV (yes, he does work for Yorkshire!) to take a look for the Emley Moor repeater GB3ET. Richard is at Skirlaugh, near Hornsea and Hull, and some 80 miles distant from the repeater. It came in well on his Sandpiper helical and Wood & Douglas pre-amp system. A couple of days later both he and Clive G8EQZ (Hull) provided on-air inputs to a talk on FM ATV given by Trevor G8CJS to the Hornsea radio club.

Now here is a letter I had best quote verbatim! It comes from Jean Fletcher G0AWX and says: "To inform all those that know her ... "HER" G1IXE, Viv has recently been appointed chairman of the Severnside TV Group and knowing how all of you enjoy having fun with Viv (?) I thought it only right to let you know.



"Genuflection is a must!!! ... as I feel sure she is the only lady chairman of a TV repeater group in the country. I am t' other female of the group so wish to support her wholeheartedly."

(I don't think any further comment is necessary except well done!)

## FOREIGN NEWS

Stanislaw Pazur sends a welcome letter from Warsaw describing the fifth jubilee meeting of the Polish Radiovideograph Club (held on May 6 and 7 in Torun). They settled on a new badge and heard lectures on SSTV and RTTY techniques. A particularly interesting talk was on packet radio by Bartosz SP3CAI and Piotr SP9BWJ, who are leaders in this mode in Poland. The club chairman Wojciech SP2JPG encouraged everyone to work in ATV techniques.

Some computer groups held demonstrations and seminars on Commodore, Atari and Sinclair computers. This was a great occasion to exchange experiences and some computer programs.

The station with the occasional callsign SP0RVG was operational during the meeting. This is one of the first stations with permission for packet radio working (a special permit is also required for SSTV in Poland). On May 6 this station made its first packet link-up with a British station, G0CIO, on the 14 Mhz band and using a Commodore 64 computer.

Richard VK4XRL writing from Brisbane, Australia, says: "Things have hotted up here as we have had our 50CM amateur segment taken away from us as from March 1. We are, however, allowed to keep our ATV repeaters operational until they require the frequencies for that area.

"However, a lot of questions have been raised about 23CM, but at this stage the Australian bandplan does not allow for FM operation. Also the bandplan for Queensland is different again. I wrote a letter to the Wireless Institute of Australia, which has been passed onto DOTC to look into our requirements. So far I think I am the only one with a 23CM FM ATV transmitter and receiver. I have been doing some experiments with satellite receivers which cover the band and seem to work quite well, although a little down on gain."

Still in the bottom half of the world, some ATV news from New Zealand, where Michael Sheffield ZL1ABS resides. "The Auckland ATV repeater has been operating for two weeks now from the beacon hut site in the Waitakere Ranges, to the west of Auckland City. The input is 443.25MHz vision AM and 448.75MHz sound FM, with output on 615.25MHz vision AM and 620.75MHz sound FM. The aeriails are double quad radiators, with screen reflectors, horizontally polarised of course. Belden 9913 coax is used. From this site there have not been any interference problems with the airport radar (602MHz).

"The repeater's 2C39-equivalent PA has been eating up zener diodes rapidly and is not functioning at present. The 2 watt solid-state driver is feeding the aerial direct at present. Beacon mode operates continuously when the repeat mode is not being brought up by incoming signals. The beacon is 3 minutes of test card/callsign, then 3 minutes of colour bars and back to test card.

"The AM squelch did not work too well as the hut has a high VHF noise level, so a video sync squelch (from 'The Best of CQ-TV') has been built and installed. Strangely no-one has been able to work through the repeater since the new squelch has been fitted, but it is suspected the receive aerial was unplugged during testing and forgotten when leaving the site!

"At my QTH, 23km line of sight away, I get P4.5 using a 9 element yagi, 15 metres of UR57 and my barefoot VCR tuner. Also the audio beacon comes in S4. It is a digital stepped frequency tone derived by dividing the FD and switching the outputs so that eight tones are sequenced. This site gives stronger signals locally than the Klondyke site (80 km to the south, trialed in 1986, but abandoned due to radar interference), but the DX possibilities are more limited.

"This means that there are two ATV repeaters operating in ZL now. Wellington is back on the air after a year QRT for rebuilding. Wayne ZL1TVW reports that activity is returning quickly, with some five stations using the repeater. Further repeater news later."

### CONTEST REMINDER

Finally, don't forget there are still three TV contests to enjoy this year: the International, the Slow-Scan and the Winter ATV. First up is the IARU contest, from 18.00 Saturday September 9 until 12.00 noon on Sunday 10; it's for all fast-scan bands. The slow-scan contest is from all day 12 November (midnight to midnight), while the winter contest is another all-band, fast-scan affair from 18.00 Saturday 9 December to 12.00 noon the next day.

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## Narrow Bandwidth TeleVision Association

The NBTVA, founded in 1975, specialises in the mechanical and low definition aspects of ATV and offers genuine (moving) TV within a basic bandwidth of 6 - 7KHz.

The techniques, basically an updated form of the Baird system, are a unique mixture of mechanics, electronics and optics.

Membership is open world-wide on the basis of a modest yearly subscription (reduced for BATC members) which provides an annual exhibition and quarterly 12-page newsletters, together with other services.

For further details write to: Doug Pitt, 1 Burnwood Drive, Wollaton, Nottingham, NG8 2DJ or telephone Nottingham (0602) 282896.

# PICTURES FROM SPACE

Leslie J. Kaye

Why is Hon. Editor 'phoning me for an article about weather satellites? The thought passed briefly; of course, those broad minded enough to think of making T.V. transmitters from microwave ovens (CQ-TV 146 page 17) are bound to want to get one up on Michael Fish & co. aren't they!

So here goes: first some waffle about the satellites and their images, next a bit about the various equipment available to the amateur, the author's set-up, and finally how amazingly little it costs to get going, and keep in touch with the ever changing events.

## WEATHER SATELLITES

Meteosat is perhaps the most well known of the weather satellites. Now in its third incarnation, it is soon to be replaced by the similar, but improved, first of the MOPS series. This satellite is in geostationary orbit above the Equator more or less on the Greenwich meridian. At 36,000km it can view the whole disk of the Earth at once.

These full disk images are transmitted to a computer in Darmstadt (West Germany), which chops them up into manageable areas, adds coastlines, and sends them back to the satellite for re-transmission to general users. The optical view of Europe is then reprocessed by the Met office to remove any remaining useful information and make it pretty. It is then broadcast to the public on BBC1 weather reports.

Meteosat is busy almost 24 hours a day. There are full disk, lower and higher magnification images, optical, water vapour and thermal images, pressure charts, wind charts, administration announcements and retransmissions of views taken by the American geostationary GOES satellites.

There are three GOES satellites serving America. They transmit almost continuously a variety of images. The Easternmost of these is high enough above the horizon to be received directly from the U.K.

"And here is a view taken from a satellite which passed overhead a few minutes ago" says the weather man on the T.V. He refers to one of the number of low orbiting satellites. These are in near polar orbits (North/South) at around 800km above the Earth. Each orbit takes about 100 minutes, during which the Earth rotates about 25 degrees, so each pass is to the West of the previous one. Each satellite is in usable radio range about four times a day. The detail of their images is much better than the geostationary satellites. A variety of optical, infra-red, radar and other formats can be received.

Low orbiting satellites currently receivable include the American NOAA series (9,10 and 11), the Russian Meteor series (2.16, 2.17, 2.18 and 3.02), Cosmos series (1766?), and the fascinating multi format Okean satellite. Meteor 3.02 could be faulty as I have not heard it for a while. China launched Feng Yun (translates as something to do with wind I think) but this went out of control not long after I managed to track it. These satellites usually only last a few years anyway, and are frequently replaced.

## TRANSMISSION MODE AND RECEIVING METHODS

Fortunately, all these satellites use the WEFAX format to send images, so much of your equipment is useful for all types. The format involves the sending of individual lines of an image one after the other. A rotating mirror in the satellite scans a line of the Earth onto a detector. The detector modulates a 2.4 kHz. audio tone depending on the intensity of light received. Start of line markers are added to the tone, and it is then sent by radio to users on Earth. Geostationary satellites send individual frames of about 800 lines, scanning upwards from the bottom. Low orbiting satellites scan a line immediately below them at right-angles to the direction of flight. The movement of the satellite is used to increment the line position, so giving a continuous image.

First requirement is a radio receiver. The low orbiting satellites transmit on the 137MHz waveband. A simple crossed dipole aerial is adequate. A purpose built radio is best, as a compromise has to be struck between allowing enough bandwidth to cope with the Doppler effect caused by the motion of the satellite, and allowing enough filtering to cut out interference. Geostationary satellites transmit on 1694.5MHz and 1691MHz. A dish aerial of about 1 metre diameter is commonly used. It is possible to obtain the images in real time, however I find it most convenient to use a cassette recorder and mains timeswitch to obtain the images that I want.

The three common methods of obtaining an image are,

1...By use of a converted fax machine. This is rather inconvenient, requires some ability with electronics, and can be expensive in terms of consumables. However, images of near photographic quality can be achieved.

2...By use of an analogue to digital converter in conjunction with a framestore. It is usually impossible to store images or to carry out more than limited processing. However in the better models, good images are obtained both in terms of resolution, and grey levels achieved.

3...By use of an analogue to digital converter in conjunction with a computer. The main snags with this are that real time processing is hindered by the radio interference given out by the machine, and that many older computers have an abysmal graphics ability. However storage and replay of images is easy, and image processing is only limited by the imagination of the programmer.

## THE AUTHOR'S SYSTEM

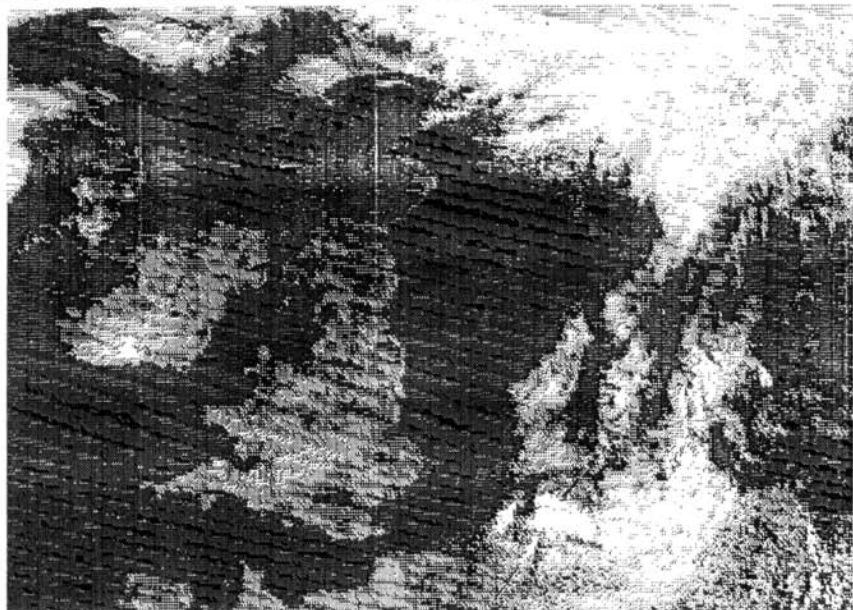
Persuaded by the advantages of a computer based system, I looked around but failed to find what I sought. The BBC model B computer was, and still is, prevalent among weather satellite watchers. The graphics ability of the machine could optimistically be described as barely adequate. So what to do? The home computer market was tending towards "games machines"; cheap, easy to use, large memory, high speed high specification graphics, the essential features for satellite image decoding.

The Atari ST was the obvious choice at the time. Although it is now surpassed in performance, it is still arguably much the leader in terms of software support and value for money. In ignorance, I took pot luck in selecting the Maplin Electronics weather satellite receiver and decoder projects. These required several evenings construction, but at a cost of about £200 I finished up with hardware to receive low orbiting satellites, equally well specified as the more expensive pre-built alternatives. Easy so far, but writing the software and getting it to work was a different story!

Enough of my problems! You, dear reader, can only have ploughed so far through all this guff in the hope of a few pointers as to how to tap into all this spectacular weather information. Despite their failure to reciprocate, I recommend membership of the Remote Imaging Group. Their quarterly newsletter (in the same format as CQ-TV) is packed with information, and well justifies the £5 membership fee. The membership secretary is Mr. Des. Watson, Norton, Ringmer, East Sussex BN8 5HX.

Yours-truly also deserves (?) a plug at this stage! A copy of my software, (single side format disk with manual) is available at £24.95. It features real time decoding and display, picture processing and analysis, zoom, grey scale or false colour palettes, data file dump to disk for later processing or for your own programmes, screen dumps to disk (for loading into "painting" software), Epson compatible printer output, satellite forecasts and more. A demonstration version is available on a double side format disk at £3.00 (or £4.50 for 2 single side format disks) all inclusive p+p Europe. The software runs on any but the very early ST's, and requires a colour monitor or T.V. All serious enquiries welcome, whether from potential customers or not (S.A.E. much appreciated).

Leslie Kaye, Fieldvale, Park Lane, Snitterfield, Warwickshire CV37 OLS



# TUBE COLLECTION

Andy Emerson G8PTH

The BATC's collection of historic TV camera tubes has grown lately, thanks largely to the generosity of Cathodeon Ltd of Cambridge and its managing director, Mr Geoff Cooper. The company, which made tubes for many years, has kindly given its own collection into the care of the BATC.

Included are an image orthicon, a monoscope, several staticons and vidicons, a photicon and a minicon. There are also two unusual double-ended read/write tubes intended for scan conversion purposes, together with many books, papers and photographs. The Club is naturally most grateful and will take good care of these items.

Some of these tubes and names may not be too familiar, though a Staticon is in fact identical to a vidicon, being Cathodeon's own trade name. The photicon (image iconoscope) was an early tube used at Alexandra Palace, Lime Grove and some ITA companies, while the minicon was a miniature photicon used on outside broadcast cameras. The vidicons and staticons include examples of both 1" and 1/2" diameter. The latter was originally manufactured specially for a miniature camera made by Pye for inspecting drains!

The C990 was one of the read/write tubes looking like a double-ended image orthicon. It was manufactured from around 1970 for radar to TV display transfer; it had also been intended for TV line standard conversion but was beaten to this by newer, solid-state techniques. In the collection there is also a smaller version using vidicon technology.

Cathodeon has always been part of the Pye group of companies and was formed in 1935, when it was the Pye's experimental department. During the last war they were the first company to make valves for anti-aircraft shells. During the 50s and 60s they were noted for their TV camera tubes: one product was the monoscope test card/caption generator, which was sold to 30 countries worldwide.

The Cathodeon company's special glass-handling skills enabled them to work in other areas, such as making glass-sealed switches for avionics purposes and a mass spectrometer sensor used in an Anglo-American satellite experiment. The company's main product line nowadays is outside the TV field, making spectral source lamps and deuterium arc lamps for chemical spectrography.

Finally, another rare addition to the collection - thanks to the generosity of a member - is an image dissector. I guess the BATC now has the most comprehensive collection of camera tubes in the country but we are still on the lookout for types we don't already have, so please contact Peter Delaney (Wargrave 3121) if you have (or know of) any looking for a good home.

# CONTEST NEWS

Bob Platts G8OZP

Reluctantly it's back to the word processor, after soaking up some of this glorious sunshine we're getting this year. Mind you, could be floods by the time you are reading this. OK. Down to business, better late than never!

## IARU Region 1 ATV Contest 1988: 70CMs Section 2 (RX only)

Callsign	Pts	QSO,s	Best DX	©Km
NL5184	5238	33	GW7ATG/P	666
NL8722	4351	30	ON7MB	346
PE1AFJ	4210	37	DC7JD/P	274
DL3EBG/P	3204	16	?????	698
DL0RU	2047	18	?????	212
OK1KWN/P	948	4	?????	373
DG2YDZ	389	5	?????	189

## IARU Region 1 ATV Contest 1988: 24CMs Section 1

Callsign	Pts	QSO,s	Best DX	©Km
DL3EBG/P	4188	18	?????	275
PE1AIG	3930	21	?????	274
G7ATV/P	3371	24	G6YKC	215
G6YKC	2980	16	G6XDY/P	236
G4WRA/P	2936	18	G4DVG	179
G4DVG/P	2740	16	G8LES	231
PA3CWS	2015	16	?????	172
DL0RU	1933	15	?????	200
G8MMF/P	1906	12	G4DVG/P	178
PA2ENG	1840	15	DJ7JG	202
PA0BOJ	1698	10	PE1MQC	199
DK6EU/M	1679	11	?????	273
PE1DWQ	1634	11	DK6EU/M	266
PE1LRS	1543	16	DL3EBG/P	278
G4CRJ	1164	9	G6YKC	155
ON5ID	1154	6	F8MM	217
G6XDY/P	1098	11	G6YKC	236
PA3DLS	750	6	PE1AIG	204
DJ7JG	704	6	?????	209
DH8YAL	699	11	?????	114
G1COI	695	6	G6YKC	151
G4VTD	682	5	G4WRA/P	278
PA3CRX	590	9	PE1AIG	129
G8ONX	532	6	G4DVG/P	90
G6IQM	427	16	G4DVG/P	105
PE1MQC	412	4	PA0BOJ	199
G0HOV	376	5	G7ATV/P	148
DC6CF	152	4	?????	46
ON5NK	106	2	ON7MB	28
DL6SL	90	3	?????	19
PA3DZA	84	1	DL3EBG/P	84
DG4SJ	68	3	?????	15

# **IARU Region 1 ATV Contest 1988: 24Cms Section 2**

Callsign	Pts	QSO,s	Best DX	@Km
PD0MYB	1050	9	DL3EGB/P	269
NL5184	705	10	DJ7JG	206
PE1JAM	187	5	PA3CWS	94
DG2YDZ	22	1	?????	22

# **IARU Region 1 ATV Contest 1988: 13Cms Section 1**

Callsign	Pts	QSO,s	Best DX	@Km
PA3CRX	14	1	PA3CWS	14
PA3CWS	14	1	PA3CRX	14

# **IARU Region 1 ATV Contest 1988: 3Cms Section 1**

Callsign	Pts	QSO,s	Best DX	@Km
G8OZP/P	167	3	GW8VZT/P	123
G8VBA/P	22	1	G8OZP/P	22

# **IARU Region 1 ATV Contest 1988: 70Cms Section 1 (TX/RX)**

Callsign	Pts	QSO,s	Best DX	@Km
GW8LIR/P	25325	57	DK1PZ	889
PA3BJC	20980	77	G8MNY/P	495
GW7ATG	20241	53	PA2ENG	666
ON4ABC	15436	53	FC1AGO	515
G4DVN/P	15302	50	DL3EGB/P	628
PE1BZL	13536	53	GW8LIR/P	614
G8MNY	12745	39	DC7JD	671
PE1LZZ	12433	48	GW8LIR/P	523
DC7JD/P	12054	28	??????	699
PA3DLS	10549	51	GW7ATG/P	527
ON5VL/A	9813	28	GW7LIR/P	684
G4CRJ	9267	29	PA3BJC	493
ON4YZ	9206	42	GW8LIR/P	610
G1COI	9066	31	FC1AJD	642
ON7GG	8951	24	GW8LIR/P	599
ON7MB	8844	26	GW8LIR/P	563
PA3DEE	8727	45	GW7ATG/P	635
DL0PT	8691	37	??????	489
PE1LRS	8521	48	ON7MB	349
PA2ENG	7617	31	GW7ATG/P	666
G7ATV/P	7188	38	G4MBN	249
G1XRC	6120	18	F5BV	556
G4VTD	5965	20	PA3BJC	458
DK6EU/M	5613	26	??????	288
ON5ID	5538	26	F6FZO	315
ON5OF	5247	35	GW7ATG/P	538
HB9AP/P	3924	19	??????	374
DH8YAL	3757	28	??????	229
PA0BOJ	3668	17	DC7JD/P	283
G6XDY/P	3436	17	ON4YZ	400
PA3CVM	3299	14	PA3BJC	259



PE1MQC	3260	21	PE1LZZ	224
DG9RAO	3005	19	?????	247
G0AVG/P	2868	12	G4VTD	220
PA3CHH	2757	36	DC7JD	332
G6IQM	2624	20	ON5VL	533
OE5SJM	2606	16	?????	272
OE5MLL	2410	24	?????	255
G4UAM	2366	5	PE1HXX	327
G8ONX	2194	15	G7ATG/P	149
ON6BM	2098	11	PA3BJC	233
PE1JRX	2075	13	PA3BJC	159
G0HOV	2068	13	G7ATG/P	148
ON5NK	1864	7	F6FZO	326
G4VBS	1468	3	GW8LIR/P	269
G1WRA/P	1411	8	GW8LIR/P	143
PA3DVI	1205	11	DC7JD/P	286
DL6SL	908	13	?????	124
PA3DZA	844	7	PA3BJC	204
DG4SJ	754	11	?????	112
DJ4SA	726	7	?????	140
ON4KBF	557	10	ON4ABC	60
G4TEP	545	5	GW8LIR/P	245
JN37UN	402	2	HB9AP/P	133
PE1JMZ	245	8	PA3BJC	180
DC6CF	118	6	?????	16
PA3CAH	104	3	PA2ENG	22

Most of you should have received certificates by now. If not, please be patient, it takes a while to wade through call-books and membership lists. If you are 'particulars withheld' in the call-book, an SAE would make things easier.

### SPRING VISION 89

To quote Tim G6XDY 'things were a bit quite for the spring vision. What with the garden to dig, the lawnmower to fix, the house to repaint, I would have thought any excuse to 'play television' would be jumped at. Obviously not so.'

Viv G1IXE wrote to say what a wonderful weekend they had pushing cars out of the mud and trying to keep dry. As the results show, their new 24CMs preamp is working well. Viv also comments that she had trouble keeping warm. *Suggestions please in a plain brown envelope to the Severnside Television group.*

Only 5 logs were entered. A little disappointing, but saves me alot of work. Perhaps all the gardens were being dug?

### Spring Vision 89: 70CM

Callsign	Pts	QSO's	Best DX	Km
GW7ATG/P	5782	24	G8MNY/P	245
G7ATV/P	4496	34	G4DVN	197
G6XDY	97	2	G8MNY/P	87

### Spring Vision 89: 24CM

Callsign	Pts	QSO's	Best DX	Km
G7ATV/P	975	34	G8LES	111
G6XDY	120	3	G8LES	37

### MAYDAY MICROWAVE 89

The glorious weather we had on Mayday produced more activity. I was pleased to receive two entries from Scotland and a pleasant letter from Dave GM3WML in Fort William. Himself and Bob GM1YGV had a two hour contact with each other and earned themselves equal 5th place. Dave comments that it is very quiet in the area, but they are generally both on 70 or 24 most weekends, so why not give them a try someday. Dave also comments that anyone who is up in that area maybe this summer would be made most welcome.

Clive G8EQZ appears to have had a hecktick weekend. What with dashing back from Rugby, forgetting sleeping bags and the portaloo, incompatable deviation and broken feeders. Well at least he enjoyed it!

Peter G8MMF Andy G4WGZ and John G8MNY managed to get out of digging the garden etc and had a good day out. Unfortunately they missed out on the good weather that most of the country had, and their tent suffered an attack of bovine destructilaria!

As for myself, I had a pleasant day out on The Long Mynd and worked the two Dave's NND and FSF. Bob G8VBA was also out, but due to a problem with a vital lead he was unfortunately not able to work anyone.

### MayDay Microwave 89: 24CM

Callsign	Pts	QSO,s	Best DX	@Km
G6YKC	1744	8	G1APD	227
G8MMF	876	7	G3NNG	117
G6XDY/P	438	10	G8MMF/P	84
G8EQZ/P	202	3	G8VDP	64
GM3WML	4	1	GM1YGV	2
GM1YGV	4	1	GM3WML	2

### MayDay Microwave 89: 3CM

Callsign	Pts	QSO,s	Best DX	@Km
G8OZP/P	203	2	G8NND/P	88
G0FSF/P	27	1	G8OZP/P	27

Log sheets, contest entry forms can be obtained from and returned to: Bob Platts G8OZP, 8 Station Road, Rolleston-on-Dove, Burton-on-Trent, DE13 9AA.....73's till next time. Bob Platts G8OZP

# CQ-TV AWARD

This award is available to both transmitting and receiving enthusiasts, in any part of the world, whether they are members of the BATC or not. The award is for contacts made using fast-scan high definition television systems only.

## TRANSMITTING AWARD

For pictures transmitted which have been successfully identified by another station, claim 2-points per kilometer; if the contact becomes a successful two-way exchange of pictures, then 10 bonus points may be claimed by each station regardless of distance. For contacts on the 1.3GHz band or above, points are doubled.

## RECEIVING AWARD

For any picture positively identified - claim for a one-way contact. Otherwise rules are as for transmitting.

## POINTS

The award is divided into four grades: For the Bronze - 1,000 points, for the Silver - 5,000 points, for the Gold - 10,000 points and for the Diamond - 100,000 points. Points already gained for an existing award may be added in when applying for a higher grade.

## CONTACTS

A station may be worked once only per day for the purpose of this award. It is quite possible for it to be gained by working the same station many times. Contacts through TV repeaters do not count.

## THE AWARD

Upon qualification for the Bronze award, a certificate will be issued together with a Bronze seal; the certificate may be up-graded later with Silver and Gold seals. The Diamond award is in the form of a specially made trophy.

## APPLICATIONS

Applications should include log details consisting of call sign, date of QSO, band, location of the station worked and points claimed. Contacts made from other than the home station should be clearly marked. QSL cards are not required, but the application should be checked and signed by either a licenced amateur or a BATC member.

CERTIFICATE APPLICATIONS SHOULD INCLUDE A LARGE (12" x 8.5") STAMPED ADDRESSED ENVELOPE. For upgrade seals an ordinary SAE should be enclosed.

Applications should be made to the Awards Manager: Bob Webb G8VBA, 78 Station Road, Rolleston-on-Dove, Burton-on-Trent Staffs. DE13 9AB. Tel: (0283) 814582

# CAMTECH ELECTRONICS

## 23cm LOW NOISE PRE-AMP

As reviewed in CQ-TV 137 our 23cm pre-amp is still one of the best buys on the market. The pre-amp employs two low noise microwave semiconductors to give a noise matched circuit with an optimum amount of RF gain. The preamp also employs an image rejection filter which has excellent out of band signal rejection and is tunable over 1200 to 1320 MHz.

### Specification

Gain	14dB
Noise Figure	2dB
Frequency Range	1200-1320 MHz
3dB Bandwidth	85 MHz
Power Supply	12v DC @ 15mA

### Prices

Kit	£23.00 P&P £1
Built & Tested	£30.59 P&P £2
Boxed	£42.66 P&P £2

Prices shown include VAT @ 15%. Please add postage and packing at rates shown. for details on this and our other products, orders and enquiries to;

Camtech Electronics, 21 Goldings Close,  
Haverhill, Suffolk, CB9 0EQ  
Tel: 0440 62779.

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## THE GLUMS?



Viv and Ivor of the Severnside TV Group  
enjoying themselves at the convention!

# CAMERA TUBES EXPLAINED

## Part-2

Peter Delaney G8KZG

Firstly, a note of explanation, to those of you who think my (brain) scanning beam has missed its target. The first paragraph and map that it refers to in part-1, seem to have nothing to do with 'Camera Tubes Explained'. The Editor changed the title from its original - 'Changing The Tube' - but left the text as it was! Still, I hope some of you enjoyed looking at the map - dating from valve, or should I say 'tube' days - and worked out all the station name puns.

In part-1 of this series we considered the basic variations of vidicon tubes. This type of tube has a target layer that behaves like lots of tiny capacitors. As light from the scene being looked at through the lens reaches the target it builds up a pattern of electric charge on each of these capacitors. The electron beam scans across these 'capacitors' in turn. The current required to discharge each one will depend on the voltage to which it has been charged by the effect of the light. The resulting varying current flows out of the target connector as the signal current. This is typically 200 nano-amperes (nA) in the dark parts of the picture, increasing to around 500nA at peak white (ie: half a micro-amp - very easy to lose!).

### THE VIDICON AND FRIENDS

There are various special forms of vidicon type tube, apart from the difference caused by differing size, scan/focus method and heater arrangements, as discussed in part-1.

The standard vidicon uses antimony trisulphide, but this suffers somewhat from lag effects - if movement is observed in poor lighting the ghost trail effect is quite easy to see. In camera tubes using a lead oxide based target layer this effect is much less noticeable. Such tubes are known as PLUMBICON or LEDDICON (both are trade names which refer to the lead oxide layer).

These lead oxide target tubes are used in broadcast type cameras, they are available in 30mm diameter, as well as the familiar 1" and 2/3" sizes. The smaller sizes can be fitted into a vidicon camera designed for that size tube, provided that the target voltage arrangement is altered as detailed below in the section dealing with alignment procedure. Incidentally, the 30mm size tubes are normally fitted from the rear of the camera, whereas the smaller sizes are fitted through the front by removing the lens and its mounting plate etc.

The CHALNICON is a tube with a cadmium selenide target, which is about forty times as sensitive as the standard vidicon, and does not suffer from burn-in. It works using operating voltages comparable to those of a standard vidicon.

The NEWVICON tube is very sensitive - an acceptable picture is produced with about a quarter the light level required by a lead oxide type tube. In this case the target layer is composed of cadmium telluride and zinc telluride. These tubes can be fitted into a vidicon camera modified as for lead oxide tubes.

The SATICON tube is yet another variation, using this time a selenium arsenic tellurium light sensitive layer. Its main advantages are the lack of flaring from bright parts of the image and its spectral response, which is high in the blue and low in the infra-red regions.

The silicon target tubes, such as the ULTRICON are very sensitive, producing a signal current similar to that of a standard vidicon for around a tenth of the light level. The target is made up of an array of tiny silicon diodes, so the process is slightly different, although they are driven in a similar way. The target supply needs altering as for lead oxide tubes. These tubes tend not to show the 'comet-tail' effect familiar with other tubes, and they do not usually suffer from images being burnt into the target.

There are several other types of tube that are vidicon based, but have an image intensifier fitted in front of the target.

The EBITRON is basically a half-inch vidicon with an intensifier, and can provide pictures by moonlight.

The SILICON INTENSIFIED TARGET tube is even more sensitive - about a thousand times better than the standard antimony trisulphide target. These intensifier tubes will not fit into an ordinary camera, as there would be no room for the intensifier section - which also requires an EHT supply of several kiloVolts.

Other tubes are available, which are sensitive to the infra-red, ultra-violet or X-ray areas of the spectrum. Heat sensitive cameras are also available, their tubes are known as pyroelectric vidicons.

## VIDICON TUBE-BASE CONNECTIONS

The basic connections to standard magnetic focus and deflection vidicons are shown in the table below:

PIN NUMBER.	CAMERA TUBE DIAMETER			
	1/2"	2/3"	1"	30mm
1	H	K	H	H
2	G4	G4	G1	G4
3	G5	H	G4	G3
4	G3	H	NC	H
5	G2	G1	G2	K
6	G1	G2	G3	G1
7	K	G3	K	G2
8	H	--	H	NC

where: H is the Heater or Filament.

K is the Cathode.

G1 is the Modulator.

G2 is the Limiter.

G3 is the Wall Anode.

G4 is the Mesh.

NC is a pin to which no connection should be made.

Note: in separate mesh tubes G4 is connected to G3, so that the tube can operate in integral mesh mode.

There is also often a short index pin. The correct positioning of the tube in the scan coils is such that the target ring connects to its connector, and that an imaginary line from the centre of the tube base through the index pin is horizontal. Some lead oxide type tubes have an index mark on the base, which should be set so that the imaginary line through it and the tube base centre is vertical.

## SETTING UP VIDICON TUBES

Having decided on the correct type of tube needed for the camera, we now need to investigate the procedures for setting up the tube. We will assume that the camera amplifier controls are set to give a correct sync/blanking/picture waveform. Firstly, check that the voltages on the tube base are correct:]

Heater .....	6.3 volts.
Modulator ....	between 0 and about -80 volts, set by beam current control.
Limiter .....	300 volts.
Wall Anode ...	between 220 and 300 volts, set by fine focus control.
Mesh .....	450 volts (separate mesh tubes only).
Target .....	between 0 and 40 volts, set by target control. (see below for non-standard vidicon targets).
Cathode .....	0 volts with +ve going mixed blanking pulses around 10 to 15 volts amplitude.

Next, check that there is sufficient drive to the scan coils - typically about a 3 volt peak-to-peak field rate sawtooth wave on the vertical coils, and a 60 volt line rate pulse on the horizontal coils. It is not always obvious, but viewing the picture on a monitor will produce a smaller picture as the scan amplitude in the camera is increased. To check that there is sufficient drive increase the amplitude until a circle appears to come in from the corners of the monitor screen. This shows that the edge of the target has been reached.

The easiest way to set the scan amplitude correctly is to make a mask of appropriate size (see below) in matt black plastic, to put in front of the tube faceplate. The scan amplitudes are then set so that this mask is just out of view on the monitor. The mask will also help in checking the black level setting as well. The size of the cut-out in the mask should be:

1/2" tubes .....	6.2mm x 4.65mm
2/3" tubes .....	8.8mm x 6.6mm
1" tubes .....	12.7mm x 9.6mm
30mm tubes .....	17.1mm x 12.8mm

If the tube has not been operated for some time - say more than three months - it is recommended that it is warmed up first for about thirty minutes with no illumination on the target, the heater on and the beam current off.

Once the tube has warmed up, set the beam current for minimum current flow (ie: the most negative voltage) and adjust the lens, target and focus controls to mid-range. Slowly increase the beam current by making the modulator voltage less negative. If the picture appears

'washed out', the beam current needs to be increased further. If when the setting appears to be the best the picture is too faint, increase the lens aperture (ie: reduce the f number). If the picture appears to be negative reduce the target voltage.

There are three focus controls, and by adjusting each in turn the best focus is obtained. These controls are the lens focus (or the position of the lens relative to the tube target in cameras in which the complete scan coil/vidicon assembly can be racked to and fro), the coarse focus setting (setting the focus coil current) and the fine focus control (setting the wall anode voltage). Adjust these three controls in the order listed for the sharpest image, repeating the procedure until no further improvement can be obtained.

The vidicon target voltage is next to be adjusted. For a Leddicon (or similar), Silicon target or Newvicon tube the target voltage should be set to a FIXED value, and any automatic gain/sensitivity circuit connected to the target disabled. The tube usually has the correct voltage for its target stated on the accompanying paperwork - usually 45 volts for Leddicons, 8 volts for Silicon targets and 25 volts for Newvicons. For these types of tube the addition of neutral density filters, or careful lens adjustment will be required. The vidicon target voltage is set for a uniform picture content, in which details are not crushed in the highlights, nor is the black level too high (ie: if the lens is covered with a black cap, the monitor screen should appear black not grey). Slight readjustment of lens aperture and beam current will help get the best settings for highlights and black level. The target and beam current controls interact somewhat, so alternate fine adjustments of them should be carried out until no further improvement can be seen.

One further adjustment may be needed, that of the alignment coil current, or the alignment magnets, which are the two magnetic rings fitted around the tube at the back of the scan coils. These should be adjusted so that if the wall anode voltage (focus control) is altered there is a minimum rotation of the picture. When this happens the electron beam will hit the target at right angles, not obliquely, with a round rather than oval spot, improving the picture resolution particularly at the corners.

There may finally need to be a slight readjustment of the scan amplitudes and tube voltages, to confirm all are set at the optimum, due to the interactive nature of many of the settings. When correctly set, the waveform seen on an oscilloscope will show a 0.7 volt variation from black to peak white, without the whites being 'crushed' (distorted), and with the level of black (from, say, the tube mask plate or a capped lens) the same as the blanking level (front and back porch) either side of the sync pulses. the sync pulses will be 0.3 volts in amplitude in the 'blacker than black' (negative) direction.

This concludes part-2 of this series. In part-3 we will consider another family of camera tubes still found in amateur use, the Image Orthicon.



# G1COI - A TALE OF WOE

Where's G1COI got to, you may be asking yourselves, particularly the contest mob. The sad tale of his demise unfolds here:

The saga unfolds in Brighton, 1983'ish.

- Non-person (ie: not yet licensed) sees strange pictures on TV of person waving a piece of cardboard with F1EDM written on it.
- Research shows that its all legal, Tony Hancock was wrong.
- Non-person thinks 'this looks interesting', swots up, sits RAE. Then proclamation arrives in post .... it is hereby decreed that non-person henceforth be known as G1COI.
- Er, now wot? Management twitters into CB, expert responds with info on local emporium. G1COI visits said emporium and mutters wisely, "One of those, a couple of those and some of those wiggly bits of aluminium please my good man". Salesperson collapses in ecstasy and makes serious phone call to credit card company.
- Back home, scaffold pole plonked into back lawn, switch on funny black box. Little red and green lights come on!
- Forty thousand CQ ATV's, ½ a QSO and two years later G1COI decides to get made redundant to raise enough money to pay off credit card. Use credit card to get bigger bits of wiggly aluminium, a thing with huge fins on and a black box with more buttons. Wonder if possible to get made redundant twice from same job to pay off credit card again! Move to sunken swamp in Swindon.
- Plonk longer scaffold pole with bigger metal bits in new back lawn. Spend fortune on brass, bend about a bit and glue in a 4CX250R. after another forty thousand CQ ATV calls success! One strange QSO with eccentric chap named Barry (*likely story!*) claiming to be eeking out a survival near Banbury. Two years later move to mountain top near High Wycombe.
- Plonk two extremely long scaffold poles in latest back lawn. Exchange daily TV pics with the world. Made it at last!
- Six months later, low level life form knocks at door, mumbles Town and Country Planning Act. Tell him it's not a structure but a vehicle, only the wheel hasn't been fitted yet. Ask to see his peaked cap as proof of identity and try to suppress seething contempt for persons who fill forms in. Psychiatrist advises hatred due to bad childhood experience (nicked for riding trike on pavement aged 6½ months). Try to come to terms with mental anguish by holding discussion about rules with planning person, who advises that anyone can screw a 90cm satellite dish to house but not plonk it in back lawn.
- Two weeks later postman struggles to ram huge envelope through letter box. Inside, request from planning department to write out one hundred times why G1COI should be allowed to plonk anything in his own back garden, with demand for money to be

returned within two weeks. Grudgingly fill in forms, scrawl diagram of scaffold pole, write cheque. Carry on exchanging Tv pics with the world.

- Another two weeks pass. What's this? A queue of neighbours at door asking if letters to them from local planning department are in any way connected with the TV interference they've been continually suffering for the past six months! Thinks 'Oh \*\*\*\*'. Assure them, expertly, that this is normal and easily cured by a funny black tube with a wire hanging out. Carry on exchanging pictures with the world.
- Yet another two weeks pass. Visit from nice lady from planning department who states: "neighbours complaints require GICOI to cure TVI". Tell nice lady that TVI is nothing to do with planning consent, 'cos the RSGB says so! Nice lady retorts "Government circular advises that TVI is material consideration. Anyway pole wobbles in the wind". Suppress desire to tell nice lady that trees do too and substitute utterance about using more string. Promise to co-operate, nice lady goes away.
- Order crate full of notch filters from RSGB. Jiffy bag turns up with one in it. Phone RSGB: "Where's the rest?". "Wot rest?". Order another crate of filters. Crate arrives.
- Strut proudly round to neighbours, announce salvation and stuff filters into aerial leads. Carry on exchanging TV pics with the world. Knock at door: "I'm trying to watch Hercule Poirot. Funny black tube with wire hanging out doesn't work!".
- Carry out intensive investigation. Discover that luW of 70cm wipes out their TV at a range of 200 yards. Pull out aerial lead, wrap ferrite all over mains lead, no change. Place hands on back of TV (don't ask why!) ... magic! Unfortunately, neighbours disinclined to watch TV with hand on back cover. get huge bit of cardboard, cross out contest numbers and coat card with cooking foil. Donate to neighbours as Picasso original for placement behind TV set. Philistines not appreciative of artistic merit. Retreat.
- Contemplate. Phone Grundig: "Our sets don't do that Sir". Call RSGB: "Fit filter Sir". Thanks! Advise neighbours need to remove back cover of TV and crawl inside. "Get lost! it's under guarantee".
- Postman arrives...consent granted...a miracle...for a period of six months...deflation sets in...subject to more string and fixing TVI. It's a Catch 22 situation. Apply more string, decide to appeal about TVI, write off for appeal forms.
- Two postmen arrive carrying even larger heap of forms to fill in. File under 'to be read when desperately bored for something to do'. Decide to restrict transmissions to 3am only, in the hope that neighbours will think that TVI has gone away.
- Twenty four hour broadcasting starts. File ATV transmitter under 'dust collection'.

Anyone know how to fix a Grundig Super Elite T56 2406 GB TV with TVI?!

# SERVICES FOR MEMBERS



**AN ADVERTISING SUPPLEMENT OF  
SPECIALIST PRODUCTS AND SUPPLIES  
FOR THE TELEVISION AMATEUR**

**Includes.....**

**publications order form and  
membership number details.**

# ☆☆ PUBLICATIONS ☆☆

QTY.	PUBLICATION	PRICE EACH
.....	THE AMATEUR TV COMPENDIUM (155gm) by M.Wooding G6IQM. <i>The latest handbook featuring construction articles on video units, 24CM and 3CM ATV, and much more.</i>	£3.50 .....
.....	TV FOR AMATEURS by J.Wood G3YQC (85gm). <i>The definitive introduction to Amateur television, inc. construction articles.</i>	£1.75 .....
.....	MICRO & TELEVISION PROJECTS by T.Brown G8CJS (140gm). <i>Constructing logic and Spectrum computer based aids for ATV'ers.</i>	£1.00 .....
.....	THE BEST OF CQ-TV (130gm) By J.Wood G3YQC & T.Marsden G6JAT (130gm) <i>A compilation of the best construction articles from CQ-TV's 112 to 132.</i>	£2.50 .....
.....	THE SLOW-SCAN COMPANION (165gm) By Grant Dixon, John Wood & Mike Wooding. <i>The Slow Scanner's textbook, dealing with the whole aspect of SSTV, from basic principles to construction articles on full transceivers.</i>	£3.50 .....
	CQ-TV BACK ISSUES. The following issues are still available although stocks of some are low. Please circle those required.	
.....	<del>127,128,129</del> 135,139,143,144,145,146	£1.50 .....
.....	RE-PRINTS. Photocopies of any article from past publications are available	0.25 ..... per sheet
.....	INDEX. All main articles in past issues of CQ-TV and 7 Handbooks. Inc. page count, (essential for ordering re-prints). (40gm)	£1.00 .....
	TOTAL	£ .....
	POSTAGE (overseas members only)	£ .....
	TOTAL ENCLOSED**	£ .....

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Overseas members should ask for a postage quotation before ordering  
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are included in the prices. Send orders for publications ONLY to:-  
BATC PUBLICATIONS, 14 LILAC AVENUE, LEICESTER, LE5 1FN, ENGLAND

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address:	
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- PLEASE PRINT CLEARLY -

# MEMBERS SERVICES

Items from these lists can ONLY be supplied to CURRENT members of the BATC. These lists supercede all previous ones. Components for club projects are not available from Members Services unless contained within these lists.

PUBLICATIONS should NOT be ordered on this form. A separate form is provided for that purpose elsewhere in this supplement.

We reserve the right to change prices without notice.

All Club crystals are HC18/U (wire ended).

HB1 = ATV Handbook (blue); HB2 = ATV Handbook vol.2, or revised;

TVA = TV for Amateurs; MTP = Micro & Television Projects; COM = SSTV Companion; ATC = Amateur Television Compendium.

1" vidicon tubes are available in different heater ratings (95 and 300mA) - 6" long; (EMI types 9677, 9728 and EEV types P849). 2/3" tubes have 95mA heaters (EEV type P8037). All tubes are of separate mesh construction, with magnetic focus and cost £25 each, including postage. Electrostatic vidicons, Leddicon and Ebitron tubes are available, to special order. Members requesting information on different types of tube or equivalents for other manufacturers are asked to send a stamped, addressed envelope for their reply.

QTY	CAMERA TUBES, SCAN COILS, BASES & LENS MOUNTS	EACH	P&P	TOTAL
.....	1" Vidicon scan-coils (low Z focus)	£6.00	£1.20	.....
.....	1" Vidicon scan-coils (high Z focus )	£6.00	£1.20	.....
.....	2/3" Vidicon scan-coils	£6.00	0.80	.....
.....	Vidicon bases - 1"	£1.00	0.20	.....
.....	Vidicon bases - 2/3"	0.65	0.20	.....
.....	C Mount for lenses	£4.00	0.20	.....
.....	Vidicon camera tubes - see above	-	-	.....
.....	Image Orthicon camera tubes type 9565 ** (+ Buyer to arrange transport).	£10.00	+	.....
QTY	VIDEO CIRCUIT BOARDS AND COMPONENTS	EACH	P&P	TOTAL
.....	Sync pulse generator (HB2 rev)	£3.00	0.30	.....
.....	2.5625MHz SPG crystal for ZNA134 (HB2)	£2.75	0.20	.....
.....	SPG, greyscale, char gen (MTP)	£4.set	0.60	.....
.....	Keyboard add-on(for this char. gen) (MTP)	£2.25	0.30	.....
.....	Character generator (ATC)	£4.00	0.30	.....
.....	Teletext pattern generator (ATC)	£3.00	0.30	.....

TOTAL GOODS THIS PAGE £.....

QTY	VIDEO CIRCUIT BOARDS AND COMPONENTS	EACH	P&P	TOTAL
.....	Colour test card (set of 3-double-sided)	£15.00	0.60	.....
.....	TBP28L22 PROM for test card circle	£10.00	0.20	.....
.....	PAL colour coder (CQTV 134)	£6.00	0.30	.....
.....	Character colourizer, (printed legends HB2)	£5.00	0.30	.....
.....	Video filter (TVA and CQ-TV122)	£1.00	0.20	.....
.....	Vision processing amplifier (CQ-TV130)	£4.00	0.30	.....
.....	Vision switcher matrix (HB2)	£4.00	0.30	.....
.....	Vision switcher logic (HB2)	£4.00	0.30	.....
.....	Vision mixer (HB2)	£4.00	0.30	.....
.....	Wipe effect generator (HB2 rev)	£3.00	0.30	.....
.....	4 Way vision switch (MTP) **	£3.00	0.30	.....
.....	4 Input TEA5114 vision selector (ATC)	£3.00	0.30	.....
.....	Audio/video fader (2 pcb set) (CQ-TV140)	£2.50	0.20	.....
.....	Video level indicator (CQ-TV142)	£5.00	0.30	.....
.....	ADAC -for digital video (ATC)	£5.00	0.30	.....
.....	Read address - for digital video (ATC)	£5.00	0.30	.....
.....	Write address - for digital video (ATC)	£5.00	0.30	.....
.....	RAM card - for digital video (ATC)	£4.00	0.30	.....
.....	Digital video backplane p.c.b. (ATC)	£6.00	0.30	.....
.....	UVC3120-08 A/D,D/A i.c.(ATC)	£18.00	0.20	.....
.....	Spectrum user port (MTP)	£3.00	0.30	.....
.....	Spectrum PROM blower (MTP)	£3.00	0.30	.....
.....	PROM blower FLEX (CQ-TV143)	£5.00	0.20	.....
.....	Teletron (MTP)	£3.00	0.30	.....
.....	Teletron VDU (MTP)	£4.00	0.30	.....
.....	2716 E-PROM - Teletron VDU program	£5.00	0.20	.....
.....	2764 E-PROM - Teletron Monitor program	£5.00	0.20	.....

TOTAL GOODS THIS PAGE

£.....

QTY	RX, TX AND SSTV PCBS & COMPONENTS	EACH	P&P	TOTAL
.....	Power supplies - 2 +ve and 2 -ve rails	£3.00	0.30	.....
.....	70cm VSB transmitter-7 boards (HB2)	£15.00	0.40	.....
.....	13.14MHz TV TX crystal (HB2)	£5.00	0.20	.....
.....	70cm TV transmitter (TVA and CQ-TV122)	£3.00	0.30	.....
.....	108.875MHz TV TX crystal (TVA)	£7.00	0.20	.....
.....	ATV up-converter (TVA and CQ-TV112)	£2.25	0.30	.....
.....	Amateur television receiver (HB1)	£1.50	0.30	.....
.....	GaAs FET 24cm converter (CQ-TV144)	£3.50	0.20	.....
.....	FM-TV demodulator (CQ-TV122)	£3.00	0.20	.....
.....	Gunn diode modulator (CQ-TV141)	£2.50	0.20	.....
.....	10GHz Head unit (2 pcb set) (ATC)	£2.50	0.20	.....
.....	Tunable i.f. (ATC)	£2.50	0.20	.....
.....	6MHz audio generator (CQ-TV139)	£1.50	0.20	.....
.....	G3WCY SSTV to FSTV RX & reprint (COM)	£10.set	0.60	.....
.....	G4ENA mods for above (CQ'127,COM) set of 4	£5.set	0.30	.....
.....	G4ENA SSTV transmit board (CQ-TV129,COM) Add on to G3WCY - uses same memory	£6.00	0.30	.....
.....	G4ENA SSTV aux board (CQ-TV130,COM)	£2.00	0.20	.....
.....	G8CGK SSTV pattern gen. + notes (COM)	£3.00	0.35	.....
.....	SSTV pattern/sync generator HB2)	£3.00	0.35	.....
.....	2732 E-PROM. SSTV program (HB2)	£12.00	0.20	.....
.....	MC1445N Gated video amplifier i.c.	£3.50	0.20	.....
.....	TEA2014A video switch i.c.	£1.10	0.20	.....
.....	TEA5114A video switch i.c.	£1.50	0.20	.....
.....	2716 E-PROM - programed as a substitute for 74S262 (see mod in CQ-TV132)	£5.00	0.20	.....
.....	4.433618MHz PAL colour subcarrier crystal	£2.75	0.20	.....
.....	5MHz SPG crystal	£2.75	0.20	.....

TOTAL GOODS THIS PAGE

£.....

QTY	STATIONERY AND STATION ACCESSORIES	EACH	P&P	TOTAL
.....	BATC test card - with data sheet	0.50	0.30	.....
.....	BATC reporting chart (illustrated)	0.12	0.20	.....
.....	BATC lapel badge - diamond - button hole	0.40	0.20	.....
.....	BATC lapel badge - round - pin fastening	0.50	0.20	.....
.....	BATC callsign badge - pin fastening ++ (Please print callsign clearly)	£1.50	0.20	.....
.....	BATC key fob	0.60	0.20	.....
.....	BATC equipment stickers - 1" round	0.15	0.20	.....
.....	BATC windscreen stickers - 2.5" round	0.10	0.20	.....

TOTAL GOODS THIS PAGE    £.....

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Batches of callsign badges are sent to the engravers once per magazine cycle. Please ensure that your order reaches BATC Members Services by the CQ-TV close for press date, given at the foot of the 'Contents' page in each issue. Badges are distributed to members as soon as they have been engraved.

Some new boards are in preparation, including the PAL coder from CQTV134 and the Spectrum Freezer from Micro and Television Projects (which is usable with other types of computer). Details will be announced on the BATC Prestel pages, or you may send a suitably stamped and addressed postcard to Members Services, if you can't wait for the next CQ-TV.

## VIDICONS

We have now arranged for an additional source of vidicons to be made available through Members Services. Tubes available include electrostatic focus or deflection, and low light types not previously available to club members. Prices vary depending on the size, type and grade of tube. Please contact Members Services for information on equivalents and price and delivery times. The stripe filter tubes used in domestic type colour cameras are not available through BATC, and normally must be ordered direct from an equipment supplier.

## NORTH AMERICAN MEMBERS

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# MORE LYNX IDEAS

Andy Emmerson, G8PTH

I have recently spent a bit of time refurbishing some Pye Lynx cameras (not my favourite choice but they are easy to convert to 405 lines!). The advantage of the Lynx is that it was designed from the outset for 405, 525 and 625 line operation, also it is cheap and there are still plenty of them around at the rallies.

Non-experts (like me) will find helpful three articles in CQ-TV (issue 87 p36, 99 p8 and 130 p14); you also need a manual (which I already had, but has anyone got data for the later video board?). Experience now suggests a few more tips for anyone playing with a 'new' Lynx.

1) First of all get some really thick and sticky carpet or 'gaf-fer' tape, and cover up the auxiliary socket on the camera's base. This has some very nasty voltages on it and you will soon get fed up with getting a belt from these! Once the lid is off there is plenty of unshielded mains too, so beware!

2) No picture but plenty of video gain (patterning visible when you put a finger or screwdriver near the target connection on the video board) and adjusting the beam pot has no effect. This means you have bought a camera originally used in remote control mode and links 1 to 5 are missing inside. Fit these lynx, sorry links, and the picture will be restored.

3) For your sanity, replace the Belling-Lee coaxial connector with a two-hole BNC flange socket (grind off two corners from a four-hole one if you can't find the real thing).

4) Finally, adjust the peaking controls: they do have a visible effect on the screen.

That said, I find the Lynx distinctly unstable and prone to patterning until the case is fitted. Several examples suffer from a static hum bar which can be turned light or dark (but not invisible!) with the peaking controls. Is this easily cured? Can an expert enlighten us.

\*\*\*\*\*

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# ELANTEC VIDEO CHIPS

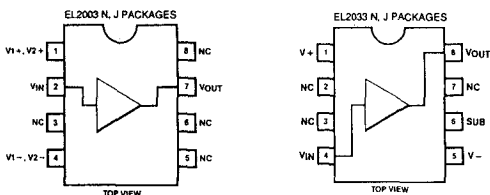
## EL2003 & EL2033 VIDEO LINE DRIVERS

The Elantec EL2003/EL2033 video line driver devices are general purpose monolithic unity gain buffers, featuring 100MHz, 3dB bandwidth and 4ns small signal rise time. These buffers are capable of delivering a  $\pm 100\text{mA}$  current to a resistive load, and are oscillation free into capacitive loads. In addition, the EL2003/EL2033 have internal output short circuit current limiting, which will protect the devices under both a DC fault condition and AC operation with reactive loads. The extremely fast slew rate of  $1200\text{V}/\mu\text{s}$ , wide bandwidth and high output drive make the devices ideal choices for closed loop buffer applications with wideband operational amplifiers (op-amps). These same characteristics and excellent DC performance make them good choices for open loop applications such as driving coaxial and twisted pair cables.

### Basic Specifications:

Differential Gain 0.1%  
Differential Phase 0.1°  
100mA continuous output  
Short circuit protected  
100MHz bandwidth  
1200V/ $\mu\text{s}$  slew rate  
2M input impedance  
Low quiescent current

### Packages and Pin-outs



### Application Hints

The IC's may be operated with single or split supplies as low as  $\pm 2.5\text{V}$  (5V total), to as high as  $\pm 18\text{V}$  (36V total). However, the bandwidth, slew rate and output impedance degrade significantly for supply voltages less than  $\pm 5\text{V}$  (10V total). It is not necessary to use equal value split supplies, for example -5V and +12V would be excellent for 0 to 1V video signals. Bypass capacitors from each supply pin to a ground plane are recommended. The devices will not oscillate even with minimal bypassing, however the supply will ring excessively with inadequate capacitance. To eliminate supply ringing and the interference it can cause, a 10 $\mu\text{F}$  tantalum capacitor with short leads is recommended for both supplies. Inadequate supply bypassing can also result in lower slew rates and longer settling times.

The input to the EL2003/EL2033 looks like a high resistance in parallel with a few picofarads, in addition to a DC bias current. The input characteristics change very little with output loading, even when the amplifier is in current limit.

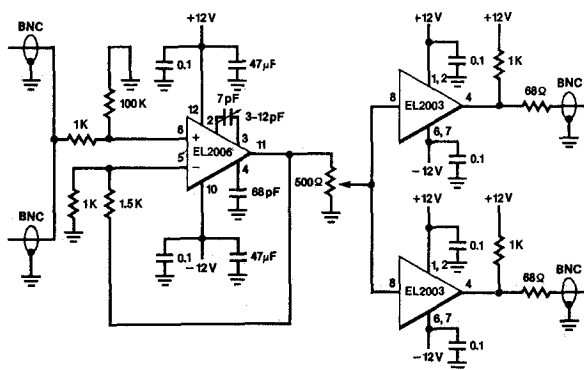
The devices exhibit excellent input/output isolation and are very tolerant of variations in source impedances. Capacitive sources cause no problems at all, resistive sources up to 100K present no problems as long as care is used in board layout to minimise output to input coupling. Inductive sources can cause oscillations; a 1K resistor in series with the buffer input lead will usually eliminate problems

without sacrificing too much speed. An unterminated cable, or other resonant source, can also cause oscillations. Again, an isolating resistor will eliminate the problem.

The output stages within the integrated circuits are protected by internal current limit circuitry. The current limit reduces with junction temperature rise. At a junction temperature of +175°C the current limits are at about 100mA. If the output is shorted to ground when operating on +/-15V supplies, the power dissipation will be greater than 1.5W, thus adequate heatsinking must be provided. Recovery time after a short circuit is in the order of 250ns.

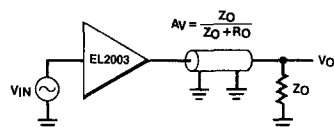
### Typical Applications

A broadcast quality video distribution amplifier is shown below. The EL2006 FET input amplifier provides a very high input impedance so that it may be used with a wide variety of signal sources, including video DAC's, CCD cameras, video switches or 75-ohm cables. The EL2006 provides a voltage gain of 2.5, while the potentiometer allows the overall gain to be adjusted to drive the standard signal levels into the back matched 75-ohm cables. Back matching prevents multiple reflections in the event that the remote end of the cable is not properly terminated. The 1K pull-up resistors reduce the differential gain error from 0.15% to less than 0.1%.



### Video Distribution Amplifier.

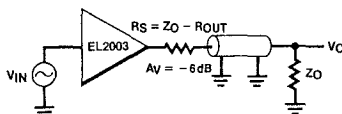
There are at least three ways to use the EL2003 and EL2033 to drive cables, as shown in the adjacent figures. The most obvious is to directly connect the cable to the output of the buffer. This results in a gain determined by the output resistance of the chip and the characteristic impedance of the cable, assuming it is correctly terminated. For RG58 into 50-ohm



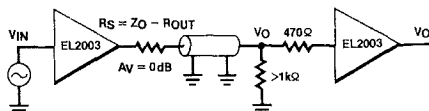
Direct Drive

the gain is about -1dB, exclusive of cable losses. For optimum response and minimum reflections it is important for the cable to be properly terminated.

Double termination of a cable is the cleanest way to drive since reflections are absorbed on both ends of the cable. The cable source resistor is equal to the characteristic impedance of the cable less the output resistance of the integrated circuit. The gain is -6dB exclusive of the cable attenuation.



Double Matched



Back Matched

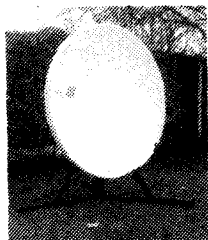
Back matching is the last and most interesting way to drive a cable.

The cable source resistor is again the characteristic impedance less the output resistance of the chip; the termination resistance is now much greater than the cable impedance. The gain is 0dB and DC levels waste no power. An additional EL2003 or EL2033 makes a good receiver at the terminating end. Because an unterminated cable looks like a resonant circuit, the receiving device should have an isolating resistor in series with its input to prevent oscillations when the cable is not connected to the driver. Of course, if the cable is always connected to the back match no resistor is necessary.

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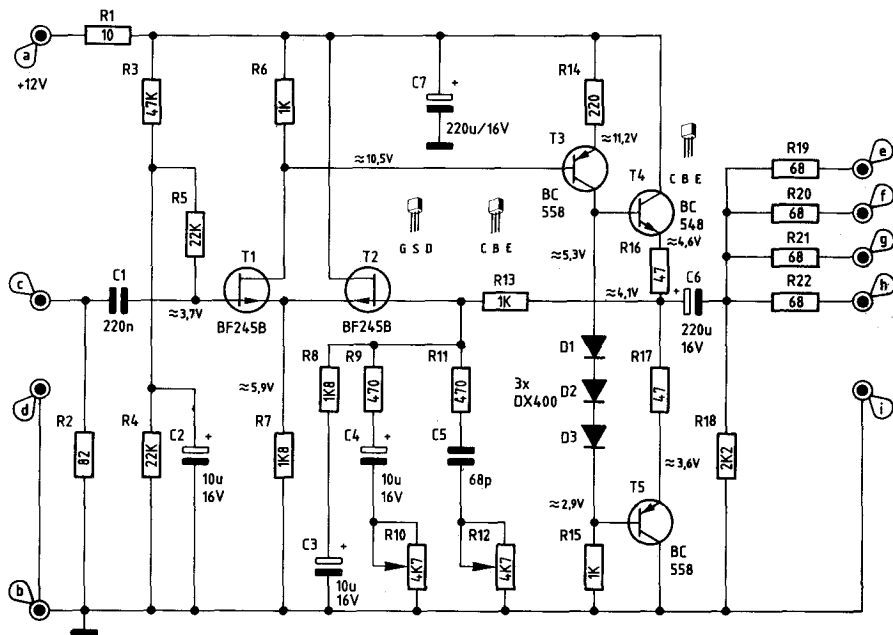
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# A VIDEO RECORDING AMPLIFIER

*This article first appeared in Elektor Electronics in April 1989 and we thank the editors for their permission to reproduce it here.*

One criterion in the judging of the quality of a video recording is the resolution or definition, that is, picture clearness, which is related directly to the bandwidth the video recorder can handle. During re-recording, some deterioration of picture quality occurs because the bandwidth is reduced to a degree that depends on the recording system. This reduction manifests itself primarily in a greater attenuation at the high-frequency end of the signal than at the low frequency end. Further loss of quality may occur through a lowering of the overall modulation level, particularly when two or more video recorders, or a video recorder and a colour television monitor, are connected in tandem to the output of the master television receiver or recorder. It would be possible to simply increase the gain of the slave equipment. Unfortunately, maximum frequency-selective amplification and optimum quality can not be achieved by simple means. There would, for instance, be a danger of over-modulation, which would result in a deterioration, rather than an enhancement, of the signal.

The amplifier described here provides separate level and modulation (contour) controls, and four independent outputs to enable the simultaneous feeding of up to four video recorders.



**Fig.1 Video Recording Amplifier.**

## CIRCUIT DESCRIPTION

The circuit of the amplifier is shown in Fig.1. Field-effect transistors T1 and T2 form a differential amplifier that offers high input impedance, small phase shift and excellent bandwidth.

The output of the master television receiver or video recorder is applied to the gate of transistor T1 via capacitor C1. Resistors R3 and R5, and capacitor C2, serve to determine the DC operating point. The output of T1 is amplified by T3, and the push-pull amplifier formed by T4 and T5, and then fed back to T2 via R13. The value of R8 ensures that the overall gain is not less than 6dB. The feedback (and the carefully designed printed circuit board) ensures excellent stability in conjunction with good phase behaviour, ample bandwidth, and adequate gain. Setting of the quiescent current through the output stages is provided automatically by low-capacitance diodes D1, D2 and D3 and emitter resistors R16 and R17. The highly stable video signal is fed to the four outputs via low-reactance electrolytic capacitor C6 and resistors R19 to R22.

The audio/visual input of video recorders and monitors is generally terminated by a 68 to 82-ohm (nominally 75-ohm), so that connection to the present amplifier results in a 6dB attenuation of the signal. Since the recording amplifier has a gain of not less than 6dB, the level of the effective input to equipment connected to its outputs is at least equal to that of its own input.

Level-control potentiometer R10 allows the gain of the amplifier to be increased to compensate for the number of outputs in use. Envelope (contour) control R12 enables extra amplification of the high-frequency part of the signal. The required bandwidth of 50Hz to 5MHz is exceeded by a large margin; the power bandwidth of the prototypes stretched from 20Hz to 25MHz.

The power requirement of the amplifier is 10 to 15 volts (nominally 12V) at 50mA. The power lines are decoupled by R1 and C7. Some video recorders have a 12V output that is ideal for the present amplifier. It is, however, advisable to consult the recorder handbook to make sure that this output can deliver up to 50mA.

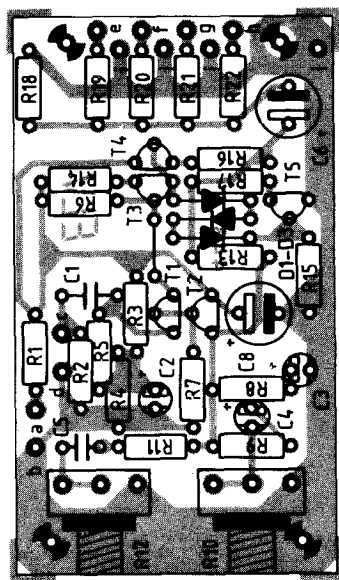
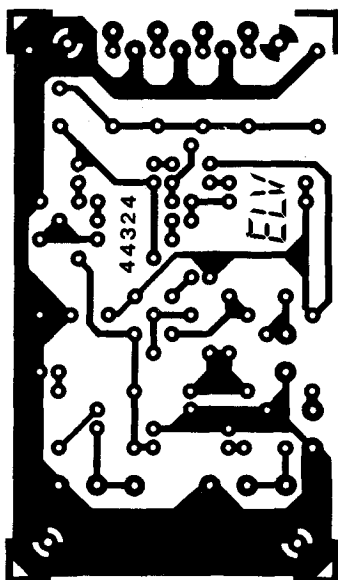
## CONSTRUCTION

The printed circuit layout and component overlay are shown actual size in Fig.2. It is highly recommended that this design is adhered to as the layout can make a substantial contribution to the correct operation of the amplifier. The two potentiometers R10 and R12 should be mounted on printed circuit board soldering pins.

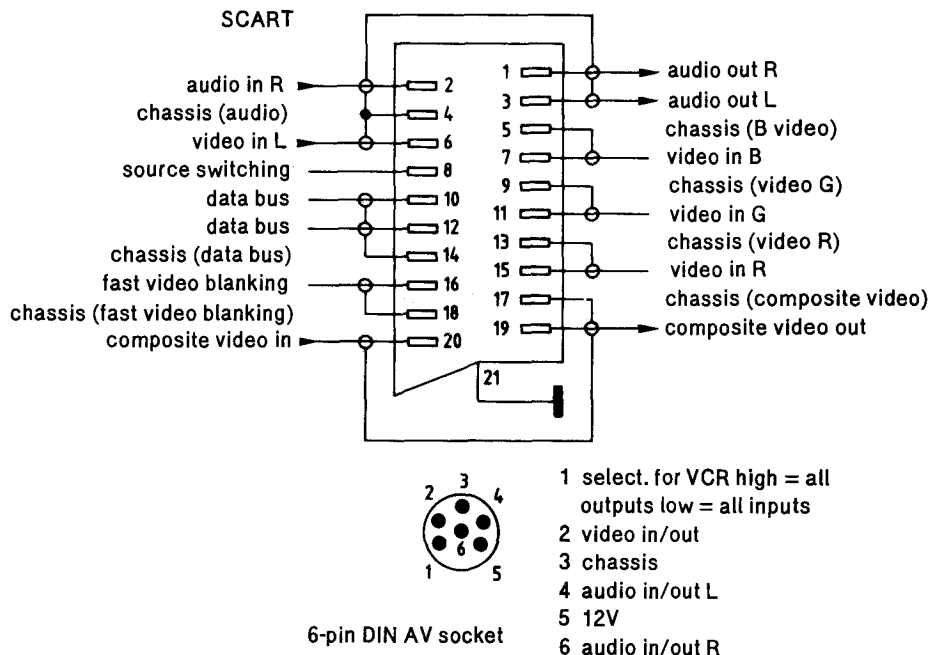
As there is quite a variety of relevant plugs and sockets used in video equipment no particular type has been specified (see Fig.3). It is best to buy a video recording cable specially made for the relevant VCR, together with the matching plug or socket, which is then fitted to the amplifier.

The audio signals at the master television receiver or video recorder output are connected direct to the slave VCR(s), as the amplifier does not cater for these signals. However, as the audio inputs on VCR's are generally terminated in high impedance, no attenuation or roll-off problems are encountered.





**Fig.2 Printed Circuit Layout and Component Overlay (actual size)**



**Fig.3 Pin-outs of the most popular sockets used on TV's and VCR's**

# **BROADCAST BAND DX-TV RECEPTION**

## MARCH

An excellent month with virtually every mode of propagation encountered. For instance, Sporadic-E produced some strong and sustained signals mainly from Spain, Italy and Scandinavia on various dates.

A major Aurora on the 13th produced quite a spectacular visual display in the northern sky in the late evening. Many signals were identified which varied from fair to weak but all were distorted and accompanied by humbars. Signals identified included TSS (Russia) R1, R4 and R7, RUV (Iceland) E3, SVT-1 (Sweden) E2, E3, E4 and E8, NRK (Norway) E4 and E5, DR (Denmark) E7, ARD-1 (West Germany) E9 and E10, TVP (Poland) R3 and a 525-line rolling picture on channel A2 from Canada or North America.

Tropospheric reception brought in several rare stations. On the 5th, Austria was noted with the "ORF FS1" PM5544 on E5 and the "ORF FS2" PM5544 on E24. On the 10th and 11th during a tropospheric lift into France a fluttery system G picture was resolved on E35 from the south-west. The signals are thought to have come from the Spanish ETB (Euskal Telebista -Basque TV) transmitter on the northern coast.

F2 reception continued well into March with early morning signals from the east. As a way of change, instances of African signals were observed on a number of occasions. Some of these were due to F2 TEP (Trans-Equatorial Skip) and occurred during the mid to late afternoon period. On the 4th a colour bar or greyscale pattern kept fluttering up above the noise from a southerly direction at 1620. At 1645 this changed to a square-looking test card which can loosely be described as a modified FuBK. We have it on good authority that Ghana uses such a test card. On the 6th a PM5544 was seen from the SSE at 1300 but the identification could not be read. There was no clock display to the right of the test pattern centre which implies that this was Kenya rather than Zimbabwe -the latter country uses the PM5534 (PM5544 with clock). A PM5534/44 has also been noted on other dates between 1230 and 1330 GMT. Chris Howles detected a frequency offset of +10kHz on the 28th.

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## **MARCH RECEPTION LOG**

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- 01.03.89: SVT-1 E2; NRK E2 (Gulen and Greipstad)  
TSS R1 and R2; DR E3; SWF-1 E4 (Raichberg)
- 03.03.89: 0745 E2 -Very dark test card similar to a PM5540 via MS  
1235 E2 -Prog (very strong) via F2 -suspect Middle East
- 04.03.89: 1335 E2 -Programme from SSE (weak) via F2  
1620 E2 -Colour bars with white motif top right hand corner from the south (weak) via TEP  
1645 E2 -Square test card (Ghana) followed by programme via TEP
- 05.03.89: Tropospheric DX with ORF-1 E5, ORF-2 E24 -both on PM5544  
SRG (Switzerland) E6 (Rigi) and E7 (Saentis)  
TSI (Switzerland) E34 (La Dole or Saentis)  
SWF-1 (W. Ger) E8 news, W. German FMs, Switzerland on 144 and 432 MHz  
0835 E2 -Iranian FuBK test card (very weak) until 0900 via F2  
0850 E2 -Co-channel programmes  
0903 E2 -Iranian FuBK with co-channel programme

0930 R1 -Programmes until 1017 approx. via F2 (USSR/China?)  
 1005 E2 -Programme with white logo in lower right-hand corner with  
 adverts at 1038 (Roman alphabet). No VITS  
 1405 E2 -Programme from south (African origin) with abrupt  
 transmitter switch off at 1429  
 1530 E2 -Programme noticed with humbars via TEP  
 1535 E2 -Greyscale/Colour bars from south until 1615  
 1618 E2 -Square test card (Ghana) (weak and short-lived) via TEP  
 06.03.89: 1300 E2 -PM5544 from SSE -suspect Kenya via F2  
 E3 and E4 "YLE TV1" test pattern (Finland)  
 07.03.89: 0800 E2 and R1 F2 signals  
 08.03.89: 0800 E2 and R1 F2 signals  
 1230 E2 -Signals from the south via F2  
 10.03.89: 0830 E2 -Arabic teletext pages (Dubai) until 1000  
 1A -Programme -RAI UNO?  
 E3 and E4 Unid programmes -suspect JRT  
 0930 E2, E3 and E4 TVE-1 in colour via SpE until 1000  
 1235 E2 -PM5544 from SSE -suspect Kenya  
 Tropospheric DX with many French UHF stations present  
 1900 E35 fluttery system G picture from SW -suspect ETB  
 11.03.89: 2020 E35 similar system G signals to the 10th, also TDF UHF  
 12.03.89: E2 -Unid signals from the south AND south-east  
 13.03.89: 0730 E2 and R1 F2 signals  
 1230 E2 -PM5544 from south-east  
 15.03.89: 1A -Unid programme; Unid E3 and 4 -JRT? Via SpE  
 16.03.89: 1430 E2 -Smeary PM5534 from south-east  
 19.03.89: E2 -Colour bars from the south  
 2205 E2 NRK (Steigen), E3 (Hemnes) on PM5534  
 2220 E2, E3 and E4 Unid progs via Auroral E  
 20.03.89: E2 -FuBK with digital clock via F2 -Iran?  
 E2 -Arabic teletext pages -Dubai  
 0837 E2 -Colour bars via F2  
 1350 E3 Bullfight from TVE-1 until 1415 via SpE  
 21.03.89: 0830 E2 and R1 smeary signals via F2  
 E3 and 4 TVE-1 progs via SpE also ghostly picture on E2  
 1500 E2 -Programme with African people from the south  
 23.03.89: 0815 1A and 1B Programmes -RAI UNO (Italy)  
 0834 L2 and L4 Canal Plus programmes (France)  
 E2 (just below) TELEMARKE Italian private station  
 0935 1A -Programme then weather -no on-screen ID  
 E2, 3 and E4 Programmes -TVE-1 (Spain)  
 E2 -PM5544 very ghostly  
 2000 E2 -SVT-1 news (Aktuele) also unidentified E4  
 2020 E3 -YLE prog in colour  
 2045 E2, E3 and E4 NRK programmes until 2145  
 24.03.89: 0700 E2 and R1 -weak F2 signals  
 25.03.89: 1A -Programmes from RAI UNO  
 26.03.89: 1245 E2 -Programme from the south via F2/TEP -no VITS  
 28.03.89: 1240 E2 -PM5544 from SSE -via F2/TEP with +10kHz offset

#### DX CONDITIONS AROUND THE WORLD

In northern India, European transmitters have been coming in since early March usually between 2350 and 0010 local time and sometimes well into the night. At 2350 on March 21st a European lady announcer could be made out. On the 12th and 14th at 2130 an FuBK was seen coming from the west. On the 14th at 1940 a weak PM5544 came through for a few minutes. On the 20th at 1650 weak signals came from the west on channel E4 with distorted sound.

The March Issue of Amateur radio Action, an Australian magazine, contains some fascinating loggings dating back to last December and January. Apparently the Moscow transmitter on R1 (exact frequency 49.747 MHz) was making a nightly appearance on the East Coast (the Leningrad transmitter is exactly 49.750 MHz). On December 23rd Norwegian TV sound was heard on 53.750 MHz between 0730 and 0745 GMT while on January 21st Russian and Polish TV were observed on channel R1 between 0000 and 1040! In fact, signals on R1 from Russia were still being monitored during early April.

Duncan Fraser of New Zealand comments that conditions have been relatively quiet since March. He writes "Following the afternoon reception of Hawaii on A2 and A3, as I reported before, there have been no more afternoon TE openings at all: this is disappointing and rather surprising seeing how often channel A2 (525-line) and C2 (China) are frequently noted in Australia. Towards the end of March, F2 reception occurred most mornings on channel A2. Signals were extremely weak and just sat there usually for several hours from switching on at 0840 until 1300 local time. The signals didn't quite make it although there were times when the 525-line signal could be locked but the pictures were just vague shapes. The only real logging, if you could call it that, was on the 23rd (0000-0055 GMT) when video of sorts was observed. The audio came up, very distorted, in English for a few minutes and local adverts (not from a network) could be heard with a 'phone number without an area code or city name. California was mentioned twice -Los Angeles maybe? While it was not really a "logging", it was at least encouraging.

"6-metre hams were working North America and the Caribbean as far as Haiti and Florida daily during this period, with reports such as "Turks and Caicos beacon in solid for 3 hours".

#### APRIL

The less said about April the better! Unfortunately the active conditions experienced during March didn't extend into April. Most DX-ers commented on the poor conditions, although most modes of propagation were experienced, including Auroral activity, but it needed a great deal of effort to see anything.

#### MAY

Despite a sluggish start with only minor openings, SpE conditions improved, although openings haven't seemed as dramatic when compared with other years. Greece was noted twice -once on the test pattern at fair strength on the 19th and again on the 20th during a weather report. Italian private stations TVA and Telemarket have been observed -the latter is still using an offset frequency just below E2. Another station, Teleradio Ercolano, has also been observed on this frequency. The Norwegian E3 transmitter at Kautokeino (located inside the Arctic Circle) has also been received. RTS Albania has already been noted twice this season on channel IC -it was very elusive during the 1988 SpE season.

High muf's have been present during some of the more intense openings with Russian signals identified on channel R5 (93.25 MHz vision) and Hungary on channel R4 (85.25 MHz vision). Although in most areas these vision frequencies will be severely interfered with by local FM transmitters, it should be possible to hear the sound channels at 91.75 and 99.75 MHz respectively directly via an FM radio.

Tropospheric reception from Scandinavia, West Germany and the Benelux countries have been noted throughout the UK. The new Danish TV-2 network seems to make a regular appearance in most areas of the country. Similarly some of the new RTL+ and SAT-1 relays in West Germany have been logged on various channels.

# MAY RECEPTION LOG

- 02.05.89: French, Belgian and Dutch troops at Band III and UHF  
NED-3 PM5544 E30 without identification (Netherlands)  
RAI UNO IA PM5544 at 0855
- 04.05.89: TVE-1 E2 via SpE  
TV-2 (Denmark) E30 and E40 via tropes
- 05.05.89: TVE-1 E2, E3 and E4 via SpE  
RAI UNO IA and IB; TSS R1, R2 and R3; RTP (Portugal) E3  
French, Belgian and Dutch troops at Band III and UHF
- 06.05.89: SVT E2; NRK E2, E3 and E4; JRT (Yugoslavia) E3 and E4  
ORF E2a and E4; CST (Czechoslovakia) R1 and R2  
DR E3; RAI UNO IA and IB; MTV (Hungary) R1 and R2; ARD E2, E3 and E4
- 07.05.89: Dutch troops at UHF
- 10.05.89: RAI UNO IA
- 12.05.89: RAI UNO IA at 0709 via SpE
- 14.05.89: TVE-1 E2 and E3 in colour between 1140-1205
- 15.05.89: RAI UNO IA via SpE at 1645
- 17.05.89: TV-2 (Denmark) E26, E27, E30, E35 and E40 via tropes  
Dutch and West German troops (inc. Radio Bremen E22)  
Danish and West German troops (inc. SAT-1 E50 -Kaiserlautern)  
TVE-1 E2 at 1100 via SpE
- 18.05.89: TSS R1 and R2; TVE-1 E2, E3 and E4; SVT E2 and E4 via SpE  
TVE-1 E2 "Galicia" clock at 1330; TSS R1 HOB0CTN at 1350  
RTP-1 E3 at 1427; +PTT SRG-1 E2 with "DRS" logo at 1935  
RAI UNO IA at 1957; ARD-1 E2 at 2132  
OIRT FM band active from 1830-1950
- 19.05.89: EPT-1 (Greece) E3 PM5534 with tone  
TV-2 (Denmark) E26, E30, E35, E40 and E56; Norway Band III
- 20.05.89: Danish, Norwegian and Dutch troops at Band III and UHF  
West German troops (inc. SAT-1 E21)  
West German troops (inc. SAT-1 E50 -Kaiserlautern)  
TSS R1, R2, R3, R4 and R5; RAI UNO IA and IB  
RTS (Albania) IC with news  
TVA (Italian private station) IA; TDF Canal Plus L2, L3 and L4  
TVE-1 E2, E3 and E4; TVE-2 E2; RTP E3  
EPT-1 E3 Greek captions on weather map; JRT E3 and E4  
MTV R1, R2 and R4; ORF E2a and E4; ARD E2, E3 and E4  
TVR R3 on Telex programme  
+PTT SRG-1 E2 (Bantiger) and E3 (Uetliberg); +PTT SSR-1 E4 (La Dole)
- 21.05.89: Dutch, French, Belgium troops; TV-2 (Denmark) E30 (Hedenstedt)  
West German troops including SAT-1 and RTL+ (W. Germany) E59
- 22.05.89: Dutch, Danish, Belgian and West German troops at Band III and UHF  
RTL+ (West Germany) E46; SAT-1 E50 (Kaiserlautern)
- 23.05.89: DR E10; TV-2 (Denmark) E40 via tropes  
Danish, Dutch and Norwegian troops (inc. NRK Lyngdal E9)  
West German troops (inc. RTL+ E21)
- 24.05.89: Dutch and West German troops
- 25.05.89: TSS R1 cartoon 1759-1800
- 26.05.89: Unid E3 and 525-line A2 signal via Aurora  
NRK E3 (Norge Kautokeino PM5534) at 1324 via SpE  
TVE-1 E2; RAI UNO IA  
YLE E3 and E4 FuBK test pattern; SVT-1 E2 "Kanal 1" PM5534  
TSS R1 progs 1050-1300  
TSS R2 UEIT with "1989" ident. at 1050 followed by  
"EESTI TV" "TALLINN" PM5537 test pattern at 1155  
TSS R3 UEIT with "LENINGRAD" ident. 1100-1245  
Dutch, French, Belgian, West German troops

RB-1 (Radio Bremen -West Germany) E22  
RTL+ E36; SAT-1 E49 (both West Germany)  
DFF-1 E11, E12 and E27; DFF-2 E34  
SVT-1 E8, E9 and E43; SVT-2 E30, E33 and E48  
NRK E10 and E11

DR E5, E6, E7, E8, E10 and E31

TV-2 (Denmark) E22, E27, E30 and E53

27.05.89: TVE E2, E3 and E4; RAI UNO IB; RTP-1 E3 at 1310

RTS IC News and programmes

Belgian and French troops (inc. La Cinq L49, Metropole 6 L34)

West German troops (inc. RTL+ E36)

28.05.89: RUV E4; SVT E2; YLE E4; NRK E2, E3 and E4

Dutch and Belgian troops

29.05.89: TVE-1 E2; SVT-1 E3 "Kanal 1" PM5534 via SpE at 1140

30.05.89: ORF E2a and E4; JRT E3 and E4; RAI UNO IA and IB

Telemarket E2 (Italian private station)

TVE-1 E3 at 1515; TSS R1 at 1655

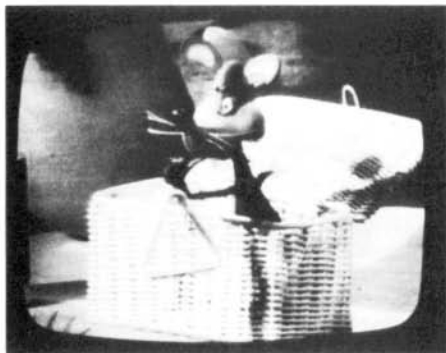
Many thanks to the following who have supplied logs and reception reports:-

Bob Brooks, Keith Hamer, Garry Smith, Kevin Jackson, Mark Dent, Kevin Bolger,  
David Glenday, Simon Hamer, Chris Howles, Iain Menzies and Terry Powell (UK);  
Duncan Fraser (New Zealand); Lt. Col. Rana Roy (India); John Papp (Australia).

### NEW TEST CARD BOOK

The 3rd Edition of "Guide to World-wide Television Test Cards" is now available featuring over 200 photos of test cards, clocks, captions and news intro's, etc. There is also useful supplementary information about the various services, including names and initials, etc.

The price is £4.95 including UK postage, £5.95 to Europe via Airmail or £7.25 to destinations outside Europe by Airmail.



The 'Loeki the Lion' mouse  
shown between Dutch TV adverts!

Russian Intervision Caption

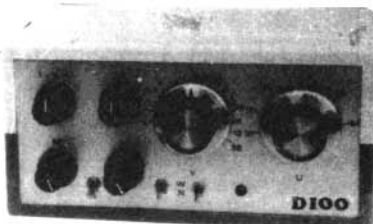
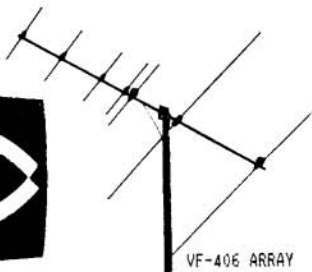


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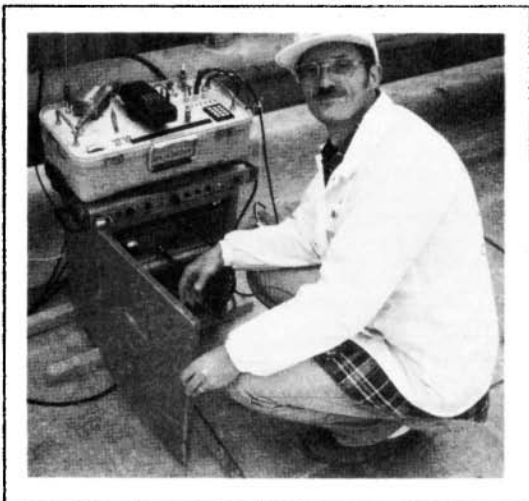
# ATV AT THE PASADENA ROSE PARADE

*Following on from the item in the NEWS column of CQ-TV 146 entitled 'ATV to be seen around the World', below is the full report of the event as reported by Bill Brown WB8ELK in the April 89 issue of Amateur Television Quarterly. We wish to thank the editors for their permission to reproduce this item here.*

An ATV first occurred during the 100th Rose Parade on Jan 2nd 1989. ATV'ers across North America were able to watch the coverage of the parade by the Amateur Television Network (ATN) group of Southern California. Thanks to the efforts of Dave Steinfeld WA6ZVE a satellite uplink was provided on Galaxy 2, transponder 5 for two hours of live coverage. The parade lasted about five hours from start until the last float got to the end of the route.

Michael Landon started the activities rolling with an entertaining introduction to ATV. Phil WB6LQP described the Amateur Television Network and some of the past events it has covered. Ernie WB6BAP then showed us his portable ATV repeater and some of the equipment necessary to follow the parade along its route.

The extensive network of portable and mobile ATV stations along the six mile long parade provided detailed coverage of any emergency of float breakdown to allow parade officials, police and medical personnel an immediate television view of the problem. Thirteen portable ATV stations on 434MHz were situated at intervals along the route as well as two Motorcycle Mobile ATV'ers (Mobile 1 & 2) and even a helicopter piloted by Tom W6ORG providing spectacular aerial shots of the parade.



The heart of the system was the portable repeater on the roof of the six-storey telephone company building. The repeater received the signals from the remote camera positions and relayed them to the emergency services area and the Wrigley Mansion (Rose Parade Control Centre) via microwave links on the 10GHz and 1.2GHz bands. Ernie WB6BAP used a small beam on the roof of the telephone company building to provide additional receive gain when needed for distant stations and the helicopter. Occasional glimpses of Ernie and the repeater could be seen during the satellite uplink.

Due to intervening buildings, a sub-repeater (932.25MHz in - 434MHz out) was located at camera 12, to relay camera 13 at the extreme end of the parade.

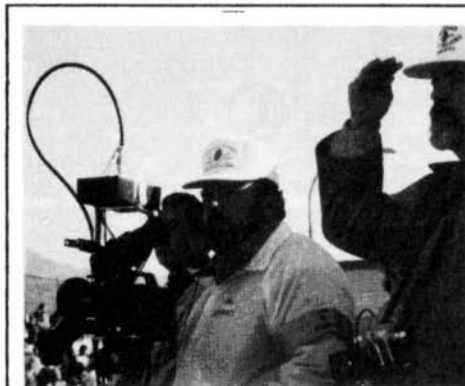
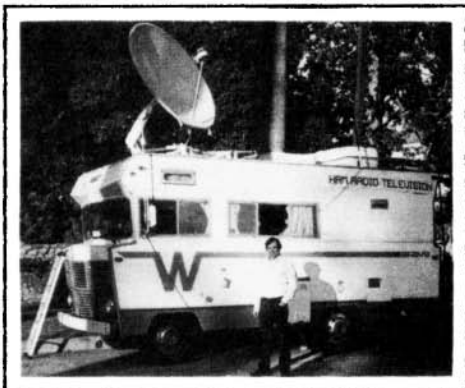




Hank WB6MEU was located in the Wrigley Mansion controlling the video levels for the satellite uplink. He was assisted by Henry KB9FO. He also routed the signal down to the Control Centre where Phil WB6LQP coordinated all the remote camera video on two meters. A Fortel video processor was used to ensure a good quality video signal for the uplink. From the Wrigley Mansion the processed video was sent via optical cable phone lines and microwave links to the satellite uplink site.

The satellite downlink was monitored at the Control Centre by Dave WA6ZVE using the portable TVRO system in his RV. The downlink was also received directly by hundreds of ATV'ers across the country. The Mt.Diablo ATV repeater near San Francisco and the Metrovision repeater near Washington D.C. relayed the downlink so their members could watch the action.

The ATN group of Southern California covers many such events throughout the year which demonstrate the incredible public service capabilities of ATV. Thanks to all those in the ATN group for showing me the setup (although I could use a new pair of shoes after walking the entire parade route!). Special thanks to Louise Candage, our dedicated ATVQ photographer, who obtained the photos in this issue, even after being lassoed by Monty Montana and nearly being eaten alive by a Chinese Dragon.



# G4ENA SSTV TX CONVERTER MOD

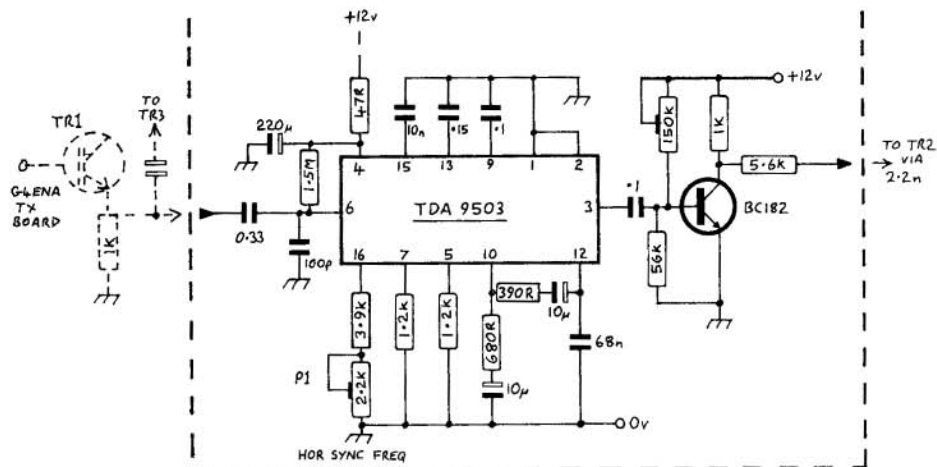
Zoltan Nemeth HA1ZH,

I have been licenced since 1962 and have been actively working Slow Scan TV since 1973. During November last year I made the first colour SSTV contact from Hungary. The equipment in use is a home brew G3WCY/G4ENA SSTV transmit and receive scan converter system (ref: The Slow Scan Companion pp52-75), operating in the 8 second and 24 second black & white and colour modes, with twelve memories for B&W and four for colour. The camera used is B&W with RGB filters.



The received picture is viewed either on a B&W monitor or a portable colour television. Captions are generated using a Spectrum 48k computer.

Whilst using the scan converter I noticed that when 'snatching' a picture from the camera (or other video source) using external sync pulses from the camera, and holding the picture in memory, vertical interference lines were present on the picture. Initially, I thought that my camera was causing this problem, but when discussing this on the bands with other SSTV'ers I was told that many stations suffer from this problem. Investigation showed that what is needed is a line sync regeneration circuit, to reshape and reinsert the pulses into the waveform.



**Fig.1 Sync Regenerator.**

The circuit of the regenerator that I built and use is shown in Fig.1. It can be constructed very simply using Vero board as the component count is quite low. The layout of the components is not critical.

To install the unit into the G4ENA converter lift the end of C6 (2n2) connected to TR1. Connect the emitter of TR1 to the input of the regenerator, and the output of the regenerator to the free end of C6. Snatch a picture and adjust P1 on the unit for a stable, interference free picture.

I would appreciate any ideas and modifications that other people may have found using this converter system. I am particularly interested in modifying the converter to operate in the 16, 32 and 48 second modes.

I am usually found every Sunday morning at around 8am on 3730kHz +/- QRM and often have SSTV QSO's with other Hungarian stations. Often heard and worked are stations from Yugoslavia and Czechoslovakia. During the week and time permitting I also operate on 14MHz.

Zoltan Nemeth HA1ZH, Vöröshadsereg u 1, 8800 Nagykanizsa, Hungary.

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# ATV AND THE AMIGA

Andy Emmerson G8PTH

The Commodore Amiga computer seems to be very much the flavour of the month nowadays, and since it is a latecomer it is only now that suppliers are providing the add-ons that we amateurs expect.

The computer is also used for professional video production purposes, for instance on 'Network 7' and 'The Chart Show', also Central TV's satellite weather forecasts. I suppose it stands a good chance of becoming the de facto standard in amateur circles as well, notwithstanding the excellence of the Philips NMS 8280 used by some BATC members.

I don't have an Amiga, nor do I have any intention of buying one, but I thought I had better 'do the business' since nobody else seems to have done a survey of the video software and hardware available. So here goes ... and note that the descriptions are based on manufacturers' claims and are not necessarily endorsed by me. I suggest you get their literature to assure yourself of the suitability of this gear. Some is clearly aimed at the professional end of the market. Remember that prices can vary according to supplier, so you may be able to beat those shown.

## VIDEO PRODUCTION SOFTWARE

ZVP VideoStudio (£79.95 from Probe Marketing, Probe House, Burnham on Crouch, CM0 8HR.). See separate review later in this article. An attractive, if pricey, program with some rough edges to be knocked off.

TV Text (£34.95 from Database Direct, Freeport, Ellesmere Port, South Wirral, L65 3EB.). Select any of nine fonts in two sizes, then re-size, rotate or stretch them. Many other effects possible.

TV Show (£34.95 from Database Direct, as above). More than 40 wipes, reveals, cuts, rolls, fades and so on. Claimed to be easy-to-use.

Photon Paint (£34.95 from Database Direct, as above). State-of-the-art drawing and colouring package.

Fantavision (£29.95 from Database Direct, as above). Two-dimensional animation package.

Deluxe Video (£69.99 from Electronic Arts, 11/49 Station Road, Langley, Slough, Bucks. Tel: 0753-49442). Enables captions and screens to be created, animated, and linked together to form a frame carousel presentation. Also suitable for titling videotapes.

Deluxe Paint II (No price given, from Triangle Television, 130 Brookwood Road, London, SW18 5DD. Tel: 01-877 1029). High resolution graphics animation tool.

Deleuxe PhotoLab (No price given, from Triangle Television, as above). Print and manipulate photo quality images.

Deluxe Productions (No price given, from Triangle Television, as above). Produce broadcast TV graphics, e.g: for weather maps.

Several other USA-sourced programs were featured in the special 'Go Video!' February 1989 issue of 'Amiga World'. These showed fabulous effects and techniques, but I suspect only in NTSC versions.

## VIDEO PRODUCTION HARDWARE

G2 VideoCenter (£595 + VAT from G2 Systems, 5 Mead Lane, Farnham, Surrey, GU9 7DY. Tel: 0252-737151). A professional standard television production centre which simply plugs into the Amiga 500, 1000 or 2000 to give the facilities of a professional video mixer, genlocker and PAL/NTSC encoder. It features video mixing, fade to black, RGB buffered and PAL/NTSC output, and is fully S-VHS compatible. Fading is controlled by software or by the high-quality manual faders provided. Special YC inputs and outputs ensure top performance when used with S-VHS format recorders.

I have not seen this unit but the photographs look superb and this firm has a very good reputation in the broadcast and sub-broadcast video field. They also supply units and software for the BBC B and Master computers.

Video Digitising kit (£395 + VAT from Triangle Television, 130 Brookwood Road, London, SW18 5DD. Tel: 01-877 1029). No further details, though the firm has impressive literature and customer base.

Colour Frame Grabber (£469 + VAT from Triangle Television, as above).

## GENLOCK UNITS

See the 'VideoStudio' review.

## SSTV AND FAX SOFTWARE

Amiga SSTV (£102.45 from ICS Electronics Ltd, P.O. Box 2, Arundel, Sussex, BN18 0NX). The software has been written by the same author as Amiga-FAX and uses the same interface card. It implements all commonly used amateur slow-scan television protocols (colour and monochrome) and permits images to be both transmitted and received. Transmitted images can be generated from Paint files or by inputting images from a TV camera via a digitiser. For those who already have Amiga-FAX, this software package can be obtained as an upgrade for only £59.95.

If you know of other packages that can be used for amateur television or can express opinions on these, why not drop me a line: Andy Emerson, 71 Falcutt Way, Northampton, NN1 8PH.

# ZVP VIDEOSTUDIO PROGRAM FOR THE AMIGA COMPUTER

Reviewed by David Wilson

*The program was kindly supplied for review by Probe Marketing (Probe House, Burnham on Crouch, Essex, CM0 8HR), from whom it is available at £79.95.*

This program is a collection of useful facilities for the video programme maker. The package is designed to run on Amiga 500 or 2000 machines and requires two disc drives and 1Mb RAM. The output is 625 lines PAL interlaced Hi-Res and the full facilities will be realised when used with a genlock device that will key the background video on a specific colour, e.g. the Rendale genlock unit but not the MiniGen unit.

The first thing I noticed was the quality of the instruction book which looked like a photocopy of a typed original. It is very worrying to find several blank pages in succession. Between the "connections to equipment" diagrams and the page entitled "Do's and Don'ts when using Videostudio" is a single page showing examples of the fonts used - and 6 blank pages!

Here is a list of the appendices in the same order that they appear in the book 1, 2 (Fonts), 4, 2 (Choosing VCR for editing), 5, 6, 9, 11, 10, 12, 13, two blank pages then appendix 15. Appendix 3 was supplied on a separate loose page. Perhaps this could benefit from a bit of editing!

The program is supplied on 2 discs and combines several useful functions:

1) **TITLE** function offers the choice of a full screen title sequencer, horizontal or vertical scroll titles (with or without a window to allow the background to show) and subtitles. The subtitle part offers keyed-in text (plain or with outline or drop shadow effect), text in a black box to aid visibility over a distracting background or addition of a multicoloured logo on the title line.

The logo can be your own, drawn on D-Paint, or a similar graphics package. A full screen copyright warning is supplied for your own use. There are plenty of demonstration files for you to view, to give an idea of how your titles would look, but not all of them work. In scroll text there is a Demo-6 file shown on the JOBLIST (list of files on the disc) but if you try to load the job you get the error message "Can't find file...". Similarly, the subtitle program has a demo file that cannot be found - "Test" file crashed.

"CAPTOR" function allows titles to be superimposed over IFF files - Interchange File Format, the standard files produced by any Amiga software (several supplied). One of the functions in the menu lists the background files - pic, cube, gb, leaf and sunset but I have found no method of changing the background in this part of the program.

2) TIME FUNCTIONS. Most of these options require the Amiga A501 clock and 512K memory module.

Option 1 sends you to item 8 on the main menu - the full screen clock.

Option 2 is a VTR countdown clock with fade to black at - 5 seconds and the ability to type in programme title, recording details etc.

Option 3 Countdown Clock, a digital display which counts down to zero. (All the following TIME FUNCTION displays are digital). This requests you to enter the number of seconds to count down from; so, for example, you could enter 90 seconds and, after asking whether or not the tenths of seconds are to be displayed, the program asks if you want to display the minutes figure. If you answer "no", the box just shows 30 seconds which could be confusing. The countdown starts when you press the spacebar. It would be nice to have the option so that when minutes display was not selected the total number of seconds left was displayed. Another interesting point is that when you have entered the number of seconds to count down from, you see the request "display tenths of sec? (Y/N)" and "display minutes? (Y/N)". If you have the CAPS LOCK light on or use the shift key when you answer Y to these questions, the program ignores the input and does not display the minutes or tenths of seconds, a point not mentioned in the instruction book. Your replies to these questions must be in lower case for everything to work correctly.

Option 4 Frame counter. The menu shows the format of the display i.e.: tells you if the hours are displayed or just the minutes and seconds. This function counts the frames in the format HH:MM:SS:FF, i.e counts up in twenty-fifths of a second.

Option 5 Stopwatch shows a 6 digit display on the menu MM:SS:TT. In actual fact only a 5 digit display is shown on the screen (minutes, seconds and tenths - not hundredths as might have been expected.)

Option 6 Inset time of day gives a choice of 12 or 24 hour clock display and then asks if you require to "display tenths of sec? (Y/N)". If you type in Y you see the seconds ticking away, but if you reply with a N you see only the hours and minutes. The requestor is obviously wrong and should read "display secs? (Y/N)". I have found an annoying flashing on the last part of this display.

There is no Option 7.

Option 8 Inset date.

Option 9 Inset time and date. This function puts a black box in the bottom right hand corner of the screen with two lines of display. The top line is the time - hours, minutes and seconds i.e. 15:05:30 and the bottom line is the date i.e. 31/01/1989. This box display can be toggled on and off

using the spacebar, BUT the box does not completely disappear - a narrow horizontal strip remains, so that you can see approximately the top fifth of the time display (the time is frozen but displays the correct time when you toggle the full box on again). At times the box has a staggered right hand edge, which looks slightly untidy, the amount of which depends on the figures displayed in the timebox. If, for example, this function was selected at a time of 1:11:11, i.e: eleven seconds past eleven minutes past one in the morning, the top line of the display would be very short as the display uses proportional spacing. The width of the top half of the box expands to fit the wider numbers, i.e: at 2 o'clock - 2:00:00, but does not contract when the numbers get narrower again. Only on the widest combination of numbers does the width of the top part equal the lower half.

3) TEST. This gives colour bars, various monochrome test signals, i.e: crosshatch, "multiburst" frequency grating, greyscales etc, and an electronic testcard which you could modify to add your own customised touches (your name, callsign etc.) since it is an IFF file which you could load into D-Paint or other graphics packages. Various tone signals accompany the test pictures. I could not use the colour bars as a test signal unless I was feeding the RGB into a correctly set up professional PAL coder.

4) PICTURE IN PICTURE. This allows you to add a small picture, such as a logo over your video and this segment gives control of selection, position and size of this insert.

5) LOGO. A full-screen logo is supplied, but you can make your own with a drawing package. This part of the program displays that together with extra words if required, i.e: "A production for the BATC. (c) 1989". This can be faded up and down using the + and - keys on the keyboard.

6) WIPES. The main use for this is for owners of a genlock system that allows the blue signal from the computer to be replaced by the background video. This section gives a choice of 9 wipe shapes - horizontal, vertical, diagonal, rotating etc, which are cued by the + and - buttons on the keyboard.

7) MATTES. This is similar to item 6 in that a blue static shape is designed to be replaced by a background video in the genlock device. There are 9 shapes to choose from for special effects and the size can be altered to suit your application using the + and - keys. As well as the usual binocular and telescope shapes there are mattes for a keyhole, rifle sights, video or SLR camera viewfinder.

8) CLOCK. You can display the clock with or without date or logo, and your text can be typed in. This menu also gives access to the time functions index.

9) VIEW IFF. This loads IFF fullscreen pictures and allows you to fade these up and down.



## CONCLUSIONS

A useful combination of titling and graphics programs. If all the minor niggles that I noticed could be ironed out, it could be a very good package.

If you only want a clock program, I do not think that it would be good value for money, but if all the facilities can be used then it would certainly be cheaper than buying a separate program for each function.

*NOTE: since this review was written (during May) version 2.2 has been released, with a better manual (now properly printed). Some minor changes have been made, though the main facilities remain unchanged.*

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# IN RETROSPECT

## LETS BUILD A REPEATER - CQ-TV 141

This information comes to us from our *respected* Chairman Trevor Brown G8CJS, and was acquired during his continuing battle with GB3ET.

When using the TEA2014 in many video circuits where it is used to drive a 75-ohm load, such as described by John Wood in 'Lets Build a Repeater' (CQ-TV 141 page 46 Fig.2) problems may be encountered with sync crushing. I encountered such a problem when adding to equipment to GB3ET, and when you're at the top of Emley TV tower you need to come up with a solution from out of your tool kit. The simple circuit shown below cures such problems by replacing the output emitter follower buffer by two transistors.

NB: The circuits described in the ATV Compendium on pages 11 and 15 may benefit from the changes shown here, the circuit on page 7 of the handbook is perfectly OK as is.

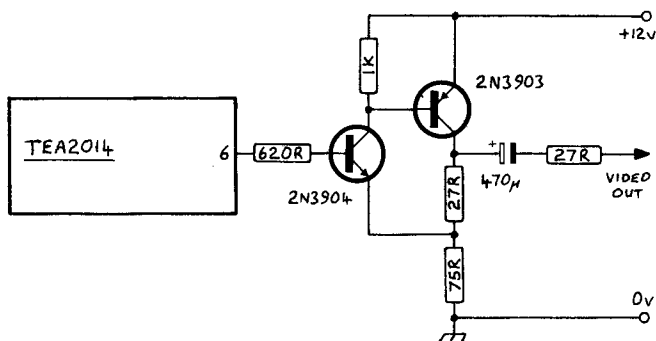


Fig.1 TEA20114 Modified Output Buffer.

## A DIGITAL FRAME STORE - THE ATV COMPENDIUM

Peter Delaney informs us that a number of gremlins appear to have crept into his Digital Frame Store project in the new handbook, The ATV Compendium. They are as follows:

Page-41...in the section 'Setting Up' paragraph two; connect channel 2 to pin-3, not pin-6 as given.

Page-42...the 43256 IC's should have the output enable pins tied low.

Pages-49 and 51...the layout diagrams are not updated to agree with the circuit diagrams. In the row of IC's above the 74LS244's a 10k resistor fits to the left of the 74LS74, grounded at the lower end. In the row above the IC alongside the 74HCT4040 should be a 74LS125, not a 74LS00as shown. Three 1k resistors should also be added - one from near pin-8 earthed at the far end, and the other two below the '125. The PCB's are correct and have correct paperwork.

Page-50...in Notes 1 only the read address card has an NE564 and therefore a trimmer to adjust.

In addition to the PCB set listed a backplane card will also be available.

## A UNIVERSAL SYNC GENERATOR - THE ATV COMPENDIUM

Peter Delaney again letting us know that the IC's SAA1043 and SAA1044 are made by Mullard (now known as Philips Components) and not Motorola.

## ON SCREEN VIDEO LEVEL INDICATOR - CQ-TV 142

Yet more from Peter Delaney! This article has two minor errors on the printed circuit boards.

1...The track needs to be cut under C23.

2... connection needs to be made from the top IC1 pin-11 to +5V.

---

# CONTEST CALENDER

IARU ATV  
(INTERNATIONAL)

Sat Sept 9th  
Sun Sept 10th

1800 Sat to 1200 Sun  
GMT

FSTV  
All Bands

SLOW SCAN TV  
AUTUMN VISION  
COMBINED

Sun Nov 12th

0001 to 2359 local

Slow Scan  
FSTV  
All Bands

WINTER ATV  
(JOINT EUROPEAN)

Sat Dec 9th  
Sun Dec 10th

1800 Sat to 1200 Sun  
GMT

FSTV  
All Bands

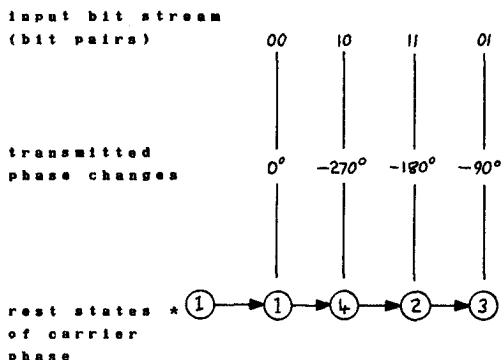
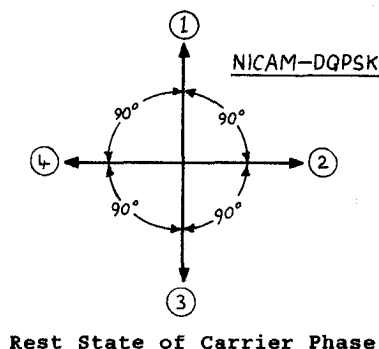
# NICAM DIGITAL STEREO SOUND

*This article first appeared in issue 40 of Teleradio News, compiled from information kindly supplied by the Independent Broadcasting Authority, Crawley Court, Winchester. We thank the editors for their permission to reproduce it here.*

For years television pictures have been accompanied by just a single audio sound track. The advent of stereo video recorders allows pre-recorded video cassettes to offer stereo, as do some low-power satellite channels. For terrestrial television the FM 'subcarrier', 6MHz higher than the vision carrier frequency, can provide analogue mono only, although the quality has been and will continue to be good. The best way to introduce stereo is to leave the present mono sound alone and add a second subcarrier, this time in digital form.

This second subcarrier has two high-quality independent channels, with a total data rate of 728 kilobits per second. The new digital subcarrier is centred on 6.552MHz above the vision carrier, and the whole arrangement is known as 'NICAM Digital Stereo'. It is a UK standard to which the IBA, the BBC and the set manufacturers are all working. The NICAM signal occupies a bandwidth of about 700kHz, 20dB below the peak vision carrier. So, even though there is a slight overlap with the upper adjacent vision channel, it is at such a low level that it does not cause interference.

The modulation method is known as Differentially Encoded Quadrature Phase Shift Keying, or DQPSK for short. Reception is extremely robust, with excellent results at quite low signal strengths, even when the picture quality is poor. It is significantly better than Teletext in coping with the effects of multipath reception (ghosting). The same coding method will be used for sound on DBS. Each channel has an audio bandwidth of 15kHz. The digital system samples each audio channel at a rate of 32kHz and the 14-bit samples are companded to 10-bits, with one bit added to each sample for parity checking. The sound quality is extremely good, subjectively similar to CD.



\* the carrier phase is assumed to be initially in rest state 1.

The transmitted phase-changes and rest-states of carrier phase for the input bit-pair sequence 00, 10, 11, 01, assuming the carrier to be originally in rest-state 1.

What is the timescale for the proper introduction of NICAM? Crystal Palace, Emley Moor and all the dependent relays of both are now transmitting a special NICAM test sequence, which will continue until the preliminary service starts in September on ITV and Channel 4. The tests consist of special tones, announcements and digitally-sourced music.

As for the rest of the country, we are working towards 75% coverage on NICAM by the end of 1990, but it will take a few years more to extend the service to all areas.

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## TELEVISION RECEPTION AND THE WEATHER

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*This article first appeared in issue 40 of Teleradio News, compiled from information kindly supplied by the Independent Broadcasting Authority, Crawley Court, Winchester. We thank the editors for their permission to reproduce it here.*

The majority of viewers are able to receive good television most of the time. There are more than 900 UHF transmitting stations, providing a choice of four programmes, covering more than 99.9% of the population of the UK. But there are some occasions during the year when pictures can be affected by the weather, causing a problem known as co-channel interference, or CCI.

Usually, this takes the form of horizontal lines moving up or down the screen, although in severe cases it can lead to a complete break-up of the picture, or even pictures from a distant transmitter. The interference can last for a few minutes, or a few hours; very occasionally it can persist over a few days.

To understand how the weather can affect reception we need to know a little about how the television signals behave as they travel through the troposphere. The troposphere is the part of the atmosphere up to a few miles above the surface of the earth and contains the weather systems. VHF and UHF radio signals normally travel more or less in straight lines and the curvature of the earth sets a limit to how far away they can be received, however powerful the transmitters.

The movement of radio waves can be affected by changes in the refractive index of the air and this is related to changes in the air temperature. Usually the temperature falls uniformly with increasing height, typically 6% degrees centigrade per kilometre. But sometimes the opposite happens and there is a sudden increase in temperature. This is known as a TEMPERATURE INVERSION.

It is even possible to have several inversions at different heights at the same time. The temperature and moisture characteristics of the air become more layered in horizontal bands and this can cause a sudden change in the refractive index. This is enough to bend VHF and UHF radio waves, causing what is known as a 'tropospheric lift' in propagation. This causes signals that would normally be lost in space to bend back towards the surface of the earth. In the crowded television bands these refracted signals are likely to cause interference, perhaps as far as 200 or 300 miles away. The same can happen to VHF radio reception also.

So what are the weather conditions associated with temperature inversion? By their very nature inversions tend to limit vertical currents of air and this leads to any moisture, even smoke and dust, being trapped in a layer just below the inversion. This implies settled weather, and quite common can be a layer of mist or fog forming near the surface at night, as the ground cools.

Inversions can also occur at high altitudes, in which case a distinctive layer of cloud can form. If there is any layering effect in cloud, smoke, haze or fog, then there is almost certainly a temperature inversion.

Often the inversion is formed by an anticyclone, or slow-moving area of high pressure. If an inversion becomes established, it could take several days to clear, although the effect tends to be quickly removed by advancing cold fronts. The essential ingredients of a temperature inversion can be found also in coastal areas during hot summer days. It is caused then by cool, moist air being carried inland from over the sea and, as the day progresses, the inversion and its effect on reception moves further inland.

A similar situation can occur after a long, cold spell in winter. The return of warmer, Atlantic air across cold ground can bring a blanket of low cloud or mist. The warm air rides over the cool, moist air near the ground to form what is known as an 'Advection Inversion'. This is one of the few examples where the wind strength can be quite high, yet still allow the inversion to exist. Usually, the wind has to be fairly light.

Sometimes Radio Amateurs take advantage of these conditions to work distant stations. It is an advantage normally to put the aerial up as high as possible to receive distant signals, perhaps climbing to the top of the nearest hill. During a temperature inversion the opposite can be true. Sometimes, it is only reception in low-lying areas that is affected, while above the inversion layer propagation conditions are normal.

Fortunately for television reception, temperature inversions do not usually last very long, although once established, any co-channel interference will not go away until the weather feature that is causing the inversion moves away. The arrival of a weather front, or the collapse of an area of high pressure, quickly restores normal reception. By carefully choosing transmission channels, polarisation and transmitter siting (all co-ordinated internationally) the broadcasters ensure interference-free reception for at least 95% of the time. But when the weather does cause interference, the best course of action is to wait for conditions to return to normal.

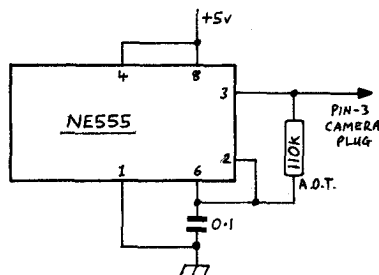
# TREVOR'S CAMERA!

Trevor brown G8CJS

Having purchased a Sony AVC3450CE camera at the convention I set about learning how to drive it. A quick word with the BATC library obtained me a copy of the circuit diagram so I was in business.

The camera comes with a short length of cable terminating in a 10-pin plug. A look at the circuit revealed that the power requirements for the camera are met by a 12 volt supply on pin-10 and ground on pin-9 of the plug. A one volt video signal is available on pin-1 with pin-2 the screen connection.

On power-up the line speed was correct, but the frame was running slow, presumably requiring a supply of external triggering pulses to speed it up. As I wanted to use the camera free-running for portable work I needed to add a simple frame pulse generator to the camera that would trigger the frame at the correct speed, with a minimum of components.



Frame Pulse Generator.

The circuit shown above provides the necessary pulses, and certainly has a low component count. The 110k resistor is best made up from two resistors as it will almost certainly require some adjustment on test to set the frame speed correctly. (My monitor suffers from a mains hum-bar, so I set the value of the resistor such that the bar did not run through. I knew that there was a good reason for not fixing the monitor before!).

I have not scrutinised the video output waveform on an oscilloscope as yet, but so far I have not had any complaints when using the camera on air, which is just as well as the above circuit is now encapsulated in Araldite.

Finally, as I mentioned before, the camera comes with a 10-pin plug fitted to the cable. This is invaluable if anyone knows where I can get a matching socket! Answers please on f5 notes to the address shown on the 'Who To Write To' page.

# LOGIC CIRCUITS

## Part-3

John Wood G3YQC

The previous part of this series showed mainly how to use TTL bistable IC's as counters. In this part, other more specialised types of devices are described, which can simplify many forms of circuit.

Followers of this series should note that in these first few parts, although the various uses of logic IC's are examined, many of the practical circuits are intended as parts of a full multi-standard TV sync pulse generator. Such a generator was the subject of a major article which appeared in CQ-TV75 and was designed by Arthur Critchley - the originator of this series.

### THE DECADE COUNTER 7490N

The decade counter contains four bistables arranged as two separate counters of two and five, but having a common reset system. An internal AND-gate changes the basic count of the three bistables B, C and D from 8 to 5 by omitting the counts of 6, 7 and 8. If the A bistable output pin 12 (Fig.1) is joined to the B bistable input pin-1 then we have a ripple counter of 10.

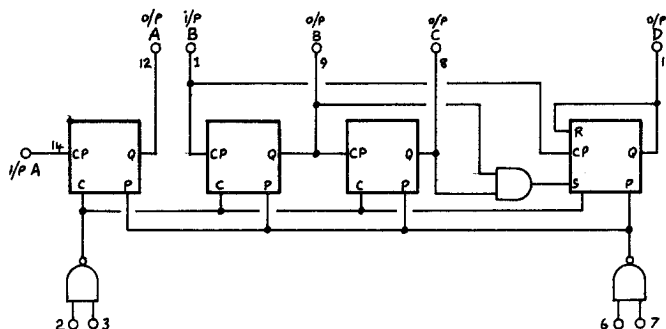


Fig.1 Decade counter 7490N

The truth table of this system is as follows:

	A	B	C	D	
Count	0	0	0	0	0
1	1	0	0	0	0
2	0	1	0	0	0
3	1	1	0	0	0
4	0	0	1	0	0
5	1	0	1	0	0
6	0	1	1	0	0
7	1	1	1	0	0
8	0	0	0	1	0
9	1	0	0	1	0
10	0	0	0	0	0

It will be seen that this is a straight-forward binary count up to 10.

The two reset gates give a means of resetting this count to either 9 or 0.

← Reset 9  
← Reset 0

Table 1

Both of these reset inputs have two inputs forming a NAND-gate. Therefore, BOTH inputs (e.g. pins 2 & 3) must be taken high in order to reset the counter. But either pin 2 or pin 3 taken low will enable the count to proceed.

This, therefore is a resettable counter of 10, but it is possible, by using the other resetting inputs to change this count of 10 to some other count less than 10 which is more useful for TV work.

Most of the counters shown in standard textbooks employ additional gates in order to miss out parts of the counting cycle, but here we have a multi-stage counter with a two-input NAND-gate unused - can it be put to use? The answer is yes, if we miss out one input pulse more than we require, because this reset is to 9 which is one LESS than the normal reset zero. Therefore if we wished to count by 5, we should reset on the 4th pulse to the 9 state.

The truth table would be:

	A	B	C	D	
Count	0	0	0	0	0
	1	1	0	0	0
	2	0	1	0	0
	3	1	0	0	0
	4	0	0	1	0
	5(9)	1	0	0	1
	0	0	0	0	0

detect this state and  
go to this state

Table 2

To detect the 4th state is easily done by joining the C bistable output to the reset 9 input(s). The pulse at C for the 4th count occurs for only some 50nS since this pulse changes the states of the 9th count immediately it occurs.

The D output has a 4 to 1 pulse which could be useful. Now, the Reset 9 input has two inputs, so different counts are possible by ringing the changes on these two inputs between the four outputs.

The following tables show many of the counts that can be obtained by this means:

	Pin	Pin	Earth	Open	8	9	11	12
Pins 2 & 3	6-8	7 to	+10	+5	+5	+7	+9	+6
to earth	6-9	"	+10	+3	+7	+3	+10	+4
i/p to 14	6-11	"	+10	nil	+9	+10	nil	nil
Pin 12 to 1	6-12	"	+10	nil	+6	+4	nil	nil
Output 11								

i.e. from +3 to +10 except +8

Table 3

All outputs are of a single positive pulse except for +10 and are from pin 11.



	Pin	Pin	Earth	Open	8	9	11	12
Pins 6 & 7	2-8	3 to	+10	-	-	-	-	-
to earth	2-9	"	+10	-	*	-	+10	-
i/p to 14	2-11	"	+10	-	-	+10	-	+9
Pin 12 to 1	2-12	"	+10	-	-	-	+9	-
Output 11								

\* Although outputs are normally from pin 11, other output pins may provide an output when pin 11 does not, e.g. this one gives -6 from pin 8.

Table 4

	Pin	Pin	Earth	Open	8	9	11	12
Pins 2&3	6-8	7 to	+10	+3	+3	+4	+5	+8
to earth	6-9	"	+10	+2	+4	+2	+10	+7
Input to 1	6-11	"	+10	high	+5	+10	high	high
Pin 11 to 14	6-12	"	+10	high	+8	+7	high	high
Output 12								

i.e. +2 to +10 except +6 and +9. Outputs +2 to +5 are a single positive pulse; +7, 8 and 10, are low for the first 5 pulses.

Table 5

	Pin	Pin	Earth	Open	8	9	11	12
Pins 6&7	2-8	3 to	+10	low	low	low	low	+7
to earth	2-9	"	+10	low	low	low	+10	+6
i/p to 1	2-11	"	+10	low	low	+10	low	+9
Pin 11 to 14	2-12	"	+10	low	+7	+6	+9	low
Output 12								

Outputs are as for table 3, +6 being a single pulse and +9 having the first 5 low.

Table 6

NOTE: In all these possibilities, the other 3 outputs may have waveforms, or spikes on them - try it and see!

This 7490N is therefore seen to be a most useful counter. However, if it is used as two independent counters it should be remembered that the reset inputs will reset BOTH parts.

There are two other similar counters, 7492N +12 and 7493 +16, but neither of these has the reset-nine input and therefore neither can be made to change count without extra gates unless the reset zero facility on pins 2 and 3 is dispensed with. In fact, for most SPG counters, there is no need for a reset input as the counter just counts away by itself. However, it may be desirable in some cases, but if not, then any of these 3 counters will give similar results for counts of less than 10 with feedback to the reset 0 inputs, as in tables 4 and 6.

It is possible to use a diode AND-gate in order to accept 3 outputs for feedback to get a count of 8, but there is normally no great use for  $\div 8$  in SPG's. However, the SPG described in CQ-TV 75 uses this method for 405 line generation.

## THE MONOSTABLE 74121N

The basic monostable described in the previous part suffers from poor voltage and temperature stability. In fact the voltage stability factor is some 30% delay change per volt of supply. A compensated monostable has been made in the form of the 74121N which has some other features as well.

Referring to Fig.2, there are two inputs A and B. A consists of two inputs to a NAND-gate whilst the B input is a Schmitt trigger input - of which more later. The monostable is an edge-triggered device which implies that the input pulse can have any length - no longer than some 50ns.

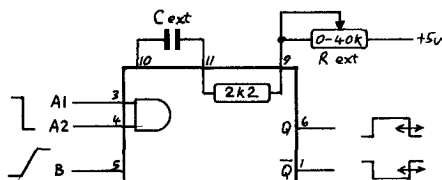


Fig.2 Monostable 74121N

Either polarity of pulse can be used as a trigger. Negative-going edges will trigger the monostable from either pin 3 or pin 4 (A input) - or both. Although the A inputs are both to a NAND-gate - the logic is negative - so the function is that of OR - or in other words, either will trigger the monostable, BUT the gate cannot be used as a NAND-gate for positive pulses.

The B input has a 'snap' action caused by internal positive feedback such that the input voltage rising above 1.5v, or so, triggers the monostable. This voltage level must be reached in order to start the triggering, but the rise time of the pulse is not critical, it can in fact be a slowly rising DC of some 1 volt per second.

There are thus two ways to drive this monostable:

1. A negative-going fast edge to pin 3 (or 4 or both).
2. A positive-going edge, fast or slow, to pin 5 - in which case pin 3 or 4 must be earthed.

The delay time, of the monostable, if pin 9 is taken to +5v is about 30ns, by using stray capacity for the timing capacitor. Provision is, however, made for external capacity to be added - up to 1000uF or so - giving up to 40 seconds. Variable control is possible by adding up to 40k Ohms in the pin 9 feed of +5v.

Pin 9 is a connection to an internal 2k Ohm resistance which goes to the pin 11 end of the timing capacitor. The delay can be extended by the ratio of

$$\frac{R_{ext} + 2k \text{ Ohms}}{2k \text{ Ohms}}$$

to the delay with external resistance - but 40 seconds is still a practical maximum although longer delays are possible with jitter.

The external timing resistance can of course be connected directly to pin 11, but a maximum value of 1.4k Ohms should be included to prevent danger to the IC input. The reason for doing this is that temperature stability, already good, is further improved. The delay with external resistance zero and pin 9 to +5v is approximately 1.3ms/uF.

The final feature is that of both  $Q$  and  $\bar{Q}$  outputs. Altogether then, the 74121N is a very useful device.

### CASCADING MONOSTABLES

Fig.3 shows three monostables wired in cascade. These monostables can be cascaded quite simply by joining  $Q$ , pin 6, to pins 3 and 4 - leaving pin 5 open. They can also be connected in a cross-coupled arrangement like a multivibrator (see Fig.4). Both  $Q$  outputs could be used but trouble would occur in starting since a pulse-edge is required and none is present unless introduced externally. However, if one feed is  $\bar{Q}$  to pin 5, then the chances of starting are increased. Since  $\bar{Q}$  goes normally high and triggers the other monostable's Schmitt input. The outputs have a total period of the sum of the two periods and various propagation delays.

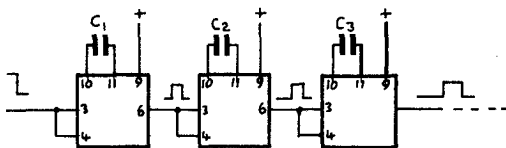


Fig.3 Cascading monostables

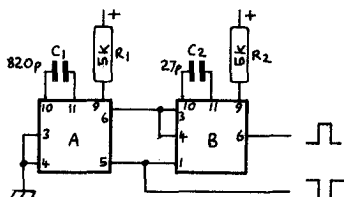


Fig.4 Cross-coupled monostables

Figs 5 and 6 show the waveforms for cross-coupled outputs and retriggering respectively. The retriggering of the 74121N monostable sooner than 100% of the delay time after the delay has finished may cause shortening of the second and subsequent cycles. This means that the cross-coupled system gives a higher frequency than expected and is not so stable as it could be. However, such an arrangement could be used as a grille generator oscillator, and the timing values given provide for about 16 vertical lines on 625. A simple rectangle, or window generator can be constructed from four of these monostables (Fig.7).

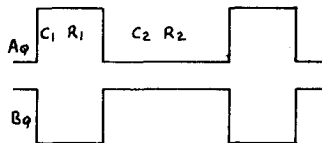


Fig.5 Cross-coupled outputs

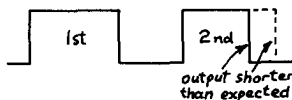


Fig.6 Retriggering

Monostable A delays the field drive pulses to define the top of the rectangle. The height is set by monostable B. The line delay is provided by monostable C and the width by monostable D. If the counting link were omitted then an AND-gate would be required to obtain the rectangle from B and D, but the link allows the horizontal signal to be produced only when a vertical one is present ( $\bar{Q}$  is low to pin 5). This generator can be run from composite sync if the Schmitt input of A is employed as a field sync separator (see Fig.8).

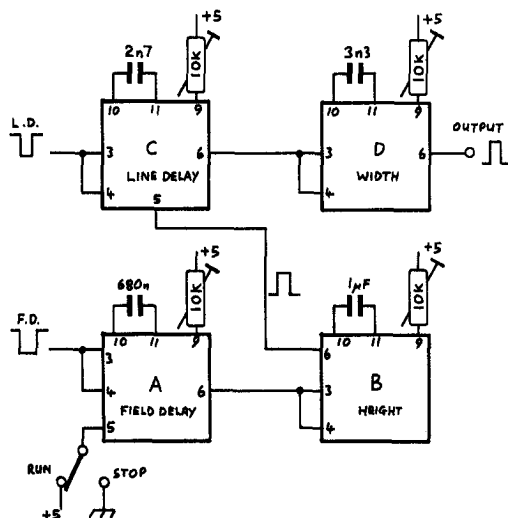


Fig.7 Rectangle or window generator

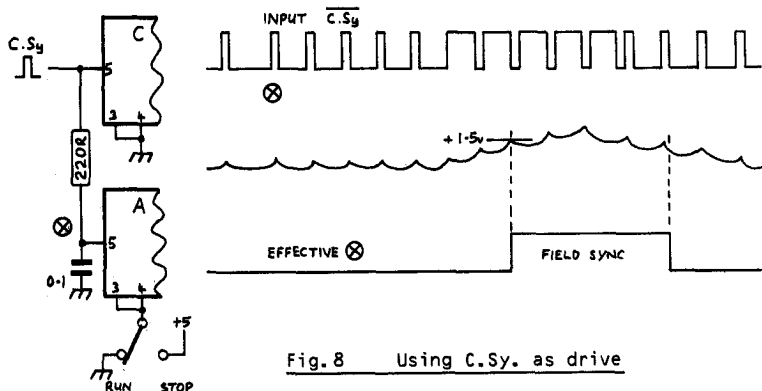


Fig.8 Using C.Sy. as drive

### THE DUAL 4-INPUT SCHMITT TRIGGER NAND-GATE 7413N

This leads on to another useful device, the dual Schmitt-trigger 7413N.

Basically this is the same as a 7420N dual 4-input NAND-gate. It is pin-for-pin compatible and will work happily as a replacement for it. But it has each of the 4 inputs arranged to give Schmitt-trigger action, so that slowly rising voltages can initiate the output change. Fig.9 shows the Schmitt operation whilst Fig.10 illustrates a sawtooth input.

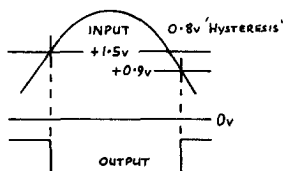


Fig.9 Schmitt operation

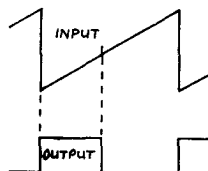


Fig.10 Sawtooth input

For rising voltages the threshold is +1.5v, where the output suddenly drops from high to low. For falling voltages the threshold is different in that it is only +0.7v. This 'hysteresis' of 0.8v causes no trouble though, since all normal logic signals go from near 0v to +4v.

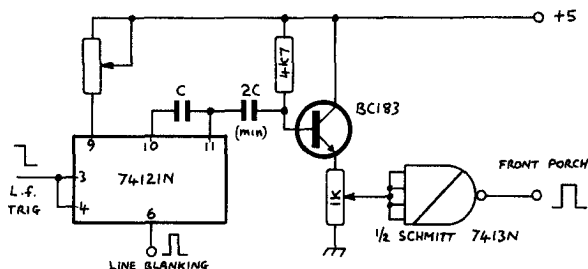


Fig.11 Front porch generation

The Schmitt-trigger gate can therefore be used on rough or slowly changing signals - provided that the input signals exceed the two threshold voltages i.e. have a range of  $>+1.5$  to  $<+0.7$ v. This provides a means of obtaining a time delay by triggering from a sawtooth - the flyback time is very short and so the 0.7v threshold can be ignored, but the 1.5v threshold ensures an output pulse after the desired time. The sawtooth amplitude is changed to alter the delay time. This in fact gives us a very simple way of generating line sync and line blanking with a proper front porch (see Fig's 11 and 12).

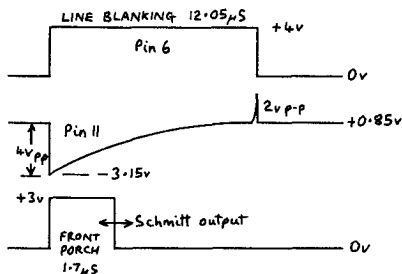


Fig.12 Waveform of monostable

On the pin 11 of the 74121N monostable is found a sawtooth waveform as shown - its length being the same as the pulse duration. The emitter follower is used as a buffer stage to avoid loading the monostable timing circuit by presenting a high input impedance. The emitter signal is almost identical with the monostable sawtooth signal, but lower down towards earth potential because of the isolating capacitor.

This pulse could be the front porch if the monostable was generating line blanking. The duration of the pulse is a constant percentage of the monostable pulse duration if the monostable delay is varied.

Perhaps the best use of the Schmitt IC is as a highly stable oscillator for driving bistable counters. Such an oscillator is shown in Fig.13 with an accompanying waveform in Fig.14.

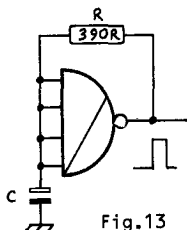


Fig.13

Schmitt oscillator

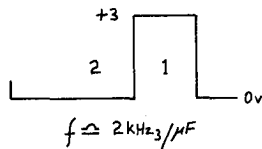


Fig.14 Waveform

The feedback resistor and capacitor form an integrator from output to input. So that when the output is high the input rises to meet it. But when the +1.5v threshold voltage is reached the output suddenly goes low and so the capacitor voltage slowly drops again until the lower threshold of the +0.7v is reached whereupon the output rises sharply again. So the system is self-starting and self-maintaining in oscillation. The output is a rectangular pulse of about 1:2 mark/space ratio, over a frequency range of 1Hz to 1MHz with 1000μF to 2nF.

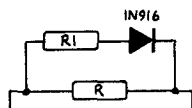


Fig.15 Square waves

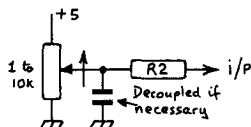


Fig.16 Changing frequency

The frequency can be changed by adjusting R but this is not recommended. Because of this resistance the fan-out is reduced to 2. Note that the output voltage of the 7413N is only about 3v p-p.

It is possible to make the output pulse square by adding a diode and resistor in parallel with the 390-Ohms in order to reduce the time constant during the 'space' only (Fig.15). The value of R1 should be about 120-Ohms.

A convenient method of frequency variation over a small range of, say 20%, is shown in Fig.16. R2 is about 4.7k for +/- 10% of frequency and the potentiometer can be placed a long way from the oscillator since it is the voltage that controls the frequency and not the

resistance. It works by modifying the threshold voltages and gives plus or minus control of frequency.

This oscillator can be gated on and off for use in a grille generator. A typical circuit is illustrated in Fig.17

This arrangement produces complete cycles of oscillations but the first one is delayed due to the extra time taken for C to charge to +1.5v. Normally it only varies between +0.7 and +1.5v.

Note that simple gating by means of one Schmitt input does not work in the above manner but can be used to switch on and off the oscillator.

The above arrangement can be made from ordinary gates if good frequency stability is not essential.

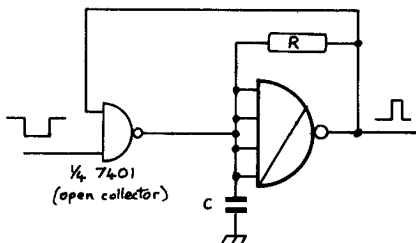


Fig.17 Gated Schmitt oscillator

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## ***LIMITED EDITION T-SHIRTS***

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YES FOLKS, YOUR CLUB DESPERATELY NEEDS YOUR EXPERT HELP.

WE NEED A MEMBER TO TAKE ON THE RESPONSIBILITY OF:

## PUBLICITY AND PUBLIC RELATIONS

This position will not take up a vast amount of time, but is a vital and important job that needs to be carried out. We need someone to get in touch with all the major magazine publishers in order to promote club affairs and activities. Also, we need someone to liaise with all the rally organisers to get the BATC advertised at these events, if not actually present. We need someone to liaise with the UK amateur radio clubs and send them information packs etc. In other words we need a Publicity and Public Relations Officer. If you feel that you would like to become a member of the committee and to take on this job please contact the Editor at the address shown on the 'Who to Write To' page at page-2 of this magazine.

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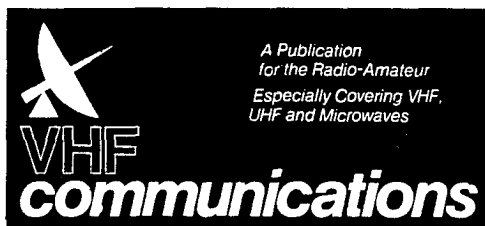
## ATV EXPEDITION

### A.T.V. EXPEDITION AT THE TOP OF THE "MONT-BLANC"

- \* date : between 16th August and 23th August 1989
- \* call : TV7SMB
- \* frequency : 438.5 MHz  
                  144.170 USB for phone  
                  144.140 FM for phone
- \* modulation : positive
- \* information on 3 580 and 7 090 MHz at 19.00 gmt

An ATV transponder will be installed at the top of the 'Aiguille du Midi' (3800m), receiving TV signals from alpinists equipped with cameras and pocket 1.2GHz transmitters (solar supplied). The transponder will re-transmit these TV pictures on 70cm with 100W into a 4 x 21 array. The transponder and associated equipment will be supplied and operated by F3YX, F9CH and F1ESA. Several amateurs, including F6ESH, F6BXC, ON4KBS, F6HXZ, and FD1MXH, will climb to the top of the Alps (4807m) transmitting ATV during their ascent. They will also be QRV for DX on: 144.330 (USB), 432.210 (USB), 432.050 (CW), 144.525 (FM) and 432,500 (FM).





VHF COMMUNICATIONS magazine is published four times per year and is available via our U.K. agent: Mike Wooding, 5 Ware Orchard, Barby, Nr.Rugby, CV23 8UF (Tel: 0788 890365). The yearly subscription is £8.75, which is payable by personal cheque, postal orders or bankers draft made payable to M.J.Wooding. The magazine is a MUST for the radio amateur interested in VHF, UHF and Microwave working, containing, as it does, detailed constructional articles for equipment operating in these bands.

### SPECIALIST 'THEME' COLLECTIONS

VHF COMMUNICATIONS has collected together selected articles from previous magazines on common topics for the convenience of specialists. One such 'theme' is amateur television, in which nine selected articles taken from VHF COMMUNICATIONS form this collection. Supplied in a smart blue binder at the very reasonable price of;

#### £11.00 (INCLUDING POSTAGE)

There are approximately 90 pages of detailed constructional descriptions of all the modules necessary for the construction of a 70cm band, AM-TV transmitter and colour test pattern generator.

This is only one example from a total of 22 theme collections listed in the table below all at £11.00 including postage. Every collection comprises nine to eleven articles in a blue binder. As well as the subject articles, each collection contains many pages of interesting publications carefully selected from VHF COMMUNICATIONS.

- |                                    |                                 |
|------------------------------------|---------------------------------|
| 1.ANTENNAS: fundamentals           | 16.CONVERTERS AND PRE-AMPS FOR  |
| 2.ANTENNAS FOR 2m and 70cm         | 2m and 70cm                     |
| 3.ANTENNAS FOR 23cm and 13cm       | 17.CONVERTERS AND PRE-AMPS for  |
| 4.MICROWAVE ANTENNAS               | 23cm and 13cm                   |
| 5.AMATEUR TELEVISION (ATV)         | 18.TRANSVERTERS AND PA's for 2m |
| 6.CRYSTAL OSCILLATORS: XO's        | 19.TRANSVERTERS AND PA's for    |
| and VXO's                          | 70cm                            |
| 7.VFO's                            | 20.TRANSVERTERS AND PA's for    |
| 10.FREQUENCY COUNTERS AND DIVIDERS | 23cm and 13cm                   |
| 11.NOISE FIGURE AND NOISE SPECTRUM | 21.CIRCUITS FOR 9cm and 6cm     |
| MEASUREMENTS                       | 22.10GHz TECHNOLOGY Part-1      |
| 12.SIMPLE TEST EQUIPMENT           | 23.10GHz TECHNOLOGY Part-2      |
| 13.HF POWER MEASUREMENTS           | 24.FM EQUIPMENT FOR 3cm and     |
| 14.SHORTWAVE AND IF CIRCUITS       | 1.5cm                           |
| 15.MINI RADIO DIRECTION FINDER     |                                 |
| for 2m and 70cm                    |                                 |

**BINDERS** available to hold twelve issues...£3.50 each.

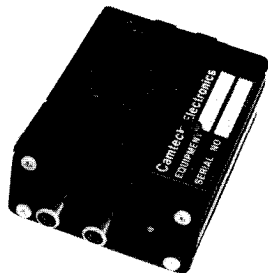
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## NEW.. 24cm COLOUR TV TRANSMITTER

This product uses the very latest surface mount component technology to give a unique small size and highly reliable product. The transmitter may be used with colour or mono video signals and an audio sub carrier input is provided.

### Specification

R.F. Output	0.5 Watts
Frequency	1240 - 1320 MHz
Modulation	FM with CCIR Pre-emphasis
Video input	75 Ohm 1v pk-pk composite video
A.S.C. input *	75 Ohm 800mV pk-pk intercarrier sound
Power Supply	12v DC @ 350mA
Size ( WxHxD )	64 x 32 x 84 mm



Composite video and Audio Sub Carrier inputs are via phono sockets, RF output is via an SMB socket. Power supply is via a 2.5mm DC power socket. All plugs/leads available P.O.A.

\* We recommend the use of our Audio Sub Carrier + Vogad board for intercarrier sound.

**£80.50 P&P £2.00**

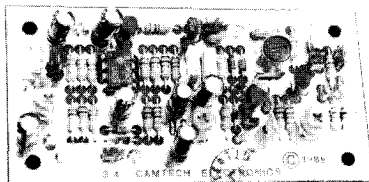
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## NEW.. AUDIO SUB CARRIER + VOGAD

Our Audio sub carrier + vogad unit is a complete audio modulation system designed for amateur television. The circuit consists of a microphone amplifier with speech compressor, audio filtering and a 6MHz oscillator / FM modulator.

### Specification

RF Frequency	6MHz Adg.+ - 500KHz
RF Output	0 to 1v pk-pk
Deviation	+ - 50 kHz
Microphone Input	
Sensitivity	4mV RMS
Power Supply	12v DC @ 16mA
Size of PCB	85 x 43 mm



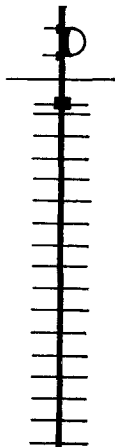
**Kit £23.00 P&P £1.00**

**Built & Tested £30.59 P&P £2.00**

Prices shown include VAT at 15%. Please add Post and packing at rates shown. For Details of these and our other products, orders and enquiries to;

Camtech Electronics, 21 Goldings Close,  
Havehill, Suffolk, CB9 0EQ  
Tel: 0440 62779

# SEVERNSIDE TELEVISION GROUP



As over 200 users from all over the UK will know, the Severnside Television Group 18 element wideband yagi is the affordable aerial for 23 cm ATV. Just look at some of its star features ;

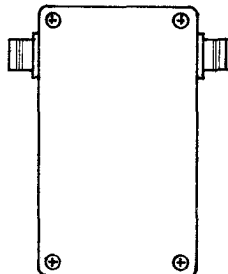
- \* Frequency coverage 1240 to 1325 MHz.
- \* Gain 10 dB across the band.
- \* SWR about 1.5 across the band.
- \* Length only 900 mm, weight only 300 g.
- \* Supplied with clamp for masts up to 55 mm in diameter. End mounting design.
- \* Neat, unobtrusive design, looks similar to but smaller than a domestic TV aerial.
- \* Price only £14.00, plus £2.50 postage.

The aerial is ideal for repeater or portable use. At this low cost, many stations use a second aerial for repeater "look through". Delivery ex-stock.

The Group is now pleased to offer G4BVK's superb high performance 1.3 GHz GaAsFET pre-amp. As used on GB3ZZ and by our band winning contest station G7ATV/P, the specification is very impressive ;

- \* Gain up to 17 dB, noise figure only 1 dB
- \* Optimised for ATV use.
- \* Fully assembled in die-cast box size 110 x 60 x 30 mm, with quality N sockets.
- \* Filtered input helps provide some protection from out of band signals.
- \* Powered from 12 V dc.
- \* Cost only £52.00, plus £1.50 postage.

Please note that the unit is not waterproof as supplied, and does not contain RF change over circuitry. Supplied with full instructions and specification sheets, or please send SAE for a full specification sheet now. Custom versions for commercial use also available.



Cheques should be made payable to "SEVERNSIDE TELEVISION GROUP". Please allow 28 days for delivery. Send your order to Severnside Television Group, c/o 15, Witney Close, Saltford, Bristol BS18 3DX. Tel. 0225 873 098, evenings and weekends only please.

**THE WORTHING AND DISTRICT  
VIDEO REPEATER GROUP  
GB3VR ATV REPEATER BRIGHTON**

**1W FM-TV 24cm TRANSMITTER** THIS TRANSMITTER GENERATES ITS SIGNAL DIRECTLY AT THE WANTED FREQUENCY WHICH MAY BE SET ANYWHERE IN THE BAND. ON-BOARD INTERCARRIER SOUND AND FIXED PRE-EMPHASIS ARE STANDARD FEATURES. THE KIT INCLUDES THE DIECAST BOX AND COSTS £70.00

**23/24cm ATV CONVERTER** THIS UNIT BLOCK CONVERTS THE 1.3GHz to THE DOMESTIC UHF TV BAND. USE THIS KIT WITH A STANDARD TV TUNER AND BATC IF PCB, FOR A COMPLETE FM RX SYSTEM. APPLICATION NOTES INCLUDED. £40.00 INC DI-CAST BOX.

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GB3VR ATV REPEATER BRIGHTON**

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THE AUTO BOARD IS A NEW ADD-ON DEVICE FOR THE 8-WAY EXPANSION BOARD DESCRIBED OPPOSITE. IT FIRST LOOKS AT THE NUMBER OF EPROMS ON THE BOARD AND THEN AUTOMATICALLY ROTATES AROUND THEM. IT WILL DISPLAY EACH EPROM FROM 5 TO 90 SECONDS IN TURN AS WELL AS HOLD. IT IS QUITE SMALL AND WILL SIT NEATLY ON THE 8-WAY BOARD. THE TIME DURATION IS SET BY A SMALL TRIMMER WHICH CAN BE MOUNTED ON A CASE IF REQUIRED. THE PRICE OF THE AUTO BOARD IS ONLY £10.00.

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THE 1WATT TRANSMITTER WAS DESIGNED BY ALAM LATHAM G8CMQ AND HAS PROVED ITSELF TO BE VERY POPULAR AMONGST ATV CONSTRUCTORS. WE RECEIVE MANY QUESTIONS ABOUT IT AND I HOPE TO BE ABLE TO ANSWER A FEW OF THEM.

THE TX IS SUPPLIED IN KIT FORM AND CONTAINS ALL THE ON BOARD COMPONENTS, A PROFESSIONAL MADE PCB WITH PLATED THROUGH HOLES, THE ALUMINIUM HEATSINKS FOR THE PA AND THE CORRECT SIZE DI-CAST BOX. THE ONLY PARTS NOT INCLUDED ARE THE CONNECTORS (3 REQUIRED) AND 1 TUNING POT (4K7 LIN).

THE TX HAS BUILT IN INTERCARRIER SOUND AND THIS IS ADJUSTABLE FROM ABOUT 5.5MHz TO 6.5MHz BY THE TURNING OF A SINGLE TRIMMER. IT IS POSSIBLE TO PUT IN A SWITCH IF REQUIRED AND BY THE ADDITION OF ANOTHER SOUND STAGE 5.5MHz AND 6.0MHz CAN BE RUN AT THE SAME TIME.

THE KIT IS SUPPLIED WITH THE CORRECT SIZE DI-CAST BOX AND THE TX MUST BE BUILT IN THIS TO MAINTAIN STABILITY, BUT OF COURSE CAN THEN BE PUT IN YOUR OWN CASE. WE CAN NOW SUPPLY THIS BOX SEPARATELY IF REQUIRED.

WE CAN ALSO SUPPLY A PHASE LOCK LOOP KIT THAT FITS INSIDE THE TX CASE ON TOP OF THE TX BOARD & YOU DONT HAVE TO REMOVE THE TX BOARD FROM THE CASE TO FIT IT. THERE ARE JUST A FEW CONNECTIONS TO THE TX BOARD AND IT DOES NOT TAKE THAT LONG TO FIT.

THE TX KIT IS NOT FOR THE BEGINNER BUT THEY SHOULD NOT BE PUT OFF AS MANY ATV HOT-SPOTS SEEM TO HAVE SOMEONE WHO PRIDES THEMSELVES IN BUILDING THESE UNITS FOR OTHERS. FOR THE AVERAGE CONSTRUCTOR, THEY CAN BE QUITE EASILY BUILT IN A FEW EVENINGS. THE AVERAGE CONSTRUCTION TIME SEEMS TO BE ABOUT 10 HOURS ALTHOUGH MANY HAVE HALVED THIS. YOU WILL REQUIRE A SOLDERING IRON SCREWDRIVERS PLIERS SPANNERS A METER A DRILL FOR THE CASE AND HEATSINK AND ABOVE ALL PATIENCE. GOOD LUCK.

WE DO OF COURSE OFFER A FULL BACK UP SERVICE TO ALL OF OUR KITS AND TO THE TX'S AND RX'S SOLD BY G8CMQ. IF YOU BREAK ANY COMPONENT OR BLOW SOMETHING UP, THEN JUST PHONE UP OR WRITE AND WE WILL TRY AND SORT IT OUT FOR YOU.

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# A NEW HAM TV MAGAZINE

FROM THE HAM THAT BROUGHT YOU ATV DX VIA BALLOON: WB8ELK  
AND

FROM THE HAM THAT GOT ATV IN THE AUG. 27 ISSUE OF **TV GUIDE**: KB9FO

**Amateur Television Quarterly.** A high quality technically oriented ham TV magazine.

## PROFESSIONAL STAFF FOR EDITING

In the tradition of the BATC, CQ-TV, Ham TV in the US needs a technically oriented ATV magazine. Amateur Television Quarterly is being started to fill this need. Each issue will cover technical subjects, build-it projects, equipment reviews, theory articles and operating news. Each issue will have virtually **no** editorial content except for FCC and operating news. Each edition will be edited by a professional staff of technical and journalistic experts. Not every item submitted will get published unless it passes our editorial and technical staff.

## VALUABLE CONTENT

The first issue is expected to be out in January of 1989. Each issue should be at least 48 easy to read pages. That's 48 pages of useful information not 12 pages of ads for in house products and promotions. Areas covered will be FSTV, SSTV, video and related subjects. Our internal text paste up is done on daisy wheel and laserjet printers . . . no hard to read dot matrix fonts!

## YOUR INPUT NEEDED

In order to succeed we encourage your input. This can be in the form of articles, operating news, subscription or comments. Amateur TV Quarterly will PAY for your technical articles. You won't get rich but it will keep you in typewriter ribbons. Our initial distribution of 4,000 copies will make you famous! This may mean even more issues per year if response is large enough! Well known ATV'ers have already submitted prime material for the debut issue.

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Please check the boxes below and let us know your thoughts about our project. You can subscribe now and the funds will be kept in escrow until we publish our first issue. Issue dates: January, April, July, October, mailed month prior, deadline second month prior.

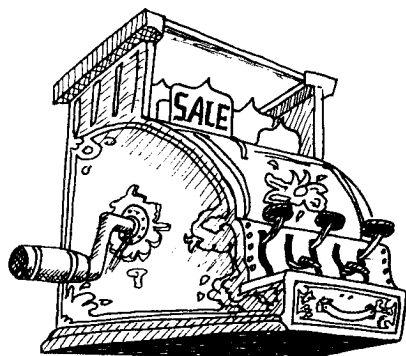
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ICOM 2E thumbwheel type in perfect working order, Complete with leather carrying case, one battery pack, battery charger, helical aerial, ¼ wave aerial and speaker mike...£125 ono.  
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 Tel: Day 0788 76125 x35, Evenings (plus answerphone) 0788 890365.

YAESU FT490R 2M MULTIMODE RADIO in mint condition, 18W output, listen on input for repeater working, 12.5kHz steps for split working...£300. YAESU FT790R 70CM PORTABLE MULTIMODE RADIO in mint condition, 2.5W output c/w matching YAESU 10W LINEAR AMPLIFIER...£300. Barry Trigger G6IKQ, 2 Stocking Lane, Shenington, Nr.Banbury. Tel: 029 587 684.

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WRASSE SC-160 SSTV CONVERTER (8 second B&W), HITACHI TV CAMERA with motorised remote zoom lens, 9" or 5" B&W monitor, tape recorder and some tapes...£200 the lot. Please arrange transport. Can be seen working any time. E.Simpson, 16 Monnington Way, Penrith, Cumberland. Tel: 0768 64890.

REMOTE CONTROL for KY1900E camera. REMOTE PAN/TILT HEAD. U-Matic EDIT SUITE with VHS source. FLUID HEAD for KY camera. For cash or exchange for Burndept hand portable radios with 10-way battery charger, fast or slow charge rate with a battery test meter. Peter J. Snell. Tel: 0634 723838

PROJECTION TV tube and scan coils, also EHT unit and schmitt optics system. All ex Decca model 1000 TV...Offers. A box of assorted VALVES, some new boxed...Offers around £10. POWER SUPPLY UNIT 6 to 24 volts regulated DC fully adjustable voltage and current limit (0 to 25 Amps). Weight around 40lb, buyer collects...Offers invited. QUANTITY of assorted electronic bits, transistors, capacitors, resistors, transformers (some 500VA), relays, gearwheels, switches, fuses, etc, etc. About 2CWT, buyer collects...Offers. HOME MADE VIDICON CAMERA based on Pye Lynx, with circuits. Working but could be improved. Spare scan/focus coil assembly, also new 1" RCA Vidicon in box...Offers for the lot. Set of CQ-TV from issue 60 to 146...Offers for the lot. C.Stanners, Fersfield, 19a Collegee Road, Newton Abbot, S.Devon, TQ12 1EG. Tel: 0626 54420.

BRYANS X-Y RECORDER type 2600 A4. ATLANTA 410A RECEIVER model 423. With IF filter, 3.5MHz bandwidth, linear phase, wideband phase demodulator. Radio Frequency coverage from 2.2GHz to 2.23GHz. Details phone 0902 343746, or write Fred Smith, 5 Pinfold Crescent, Penn, Wolverhampton, WV4 4ET.

High grade used TEST EQUIPMENT for professional and amateur requirements. RACAL receivers and a comprehensive range of RF equipment. 24cm 39-element LOOP YAGI AERIALS for ATV. 23/24cm LINEAR VALVE AMPLIFIERS, single and two stage using ceramic 3CX100A5/7289 type of valves. Also in stock a range of sundries allied to the RF world. Details write to MICROMAX RF SYSTEMS, 5 Pinfold Crescent, Penn, Wolverhampton, WV4 4ET. Tel: 0902 343746.



RIGONDA Model VL100M 6" B&W portable TV, 220/240 volts AC, or 12 volts DC. 6 Watts consumption with circuit diagram etc. Offers invited. C.Stanners, Fersfield, 19a College Road, Newton Abbot, S.Devon, TQ12 1EG. Tel: 0626 54420.

Ex BBC equipment including 'WHITE' units, 19" rack mounting items, VIDEO AMPLIFIERS, VIDEO DISTRIBUTION AMPLIFIERS, PULSE DISTRIBUTION AMPLIFIERS, a few test signal GENERATORS, video MUSA connectors, MUSA terminations, lots of AUDIO equipment, EQUALISERS, SEND amps, LINE RECEIVE amps, lots of SOUND JACKFIELDS (P.O. type jacks), some new jackfields, 19" screen mono MONITORS (Prowest) and spares for monitors, hardware for 19" racks including blank and ventilation panels, chassis and cases. TRANSMITTER UNITS for Band IV & V (valve PA and tunable cavity), EHT UNIT and valves for same. MANUALS and circuit diagrams available for most units. Some SPARES for EMI 2001 series COLOUR CAMERAS, VISION MIXER and effects units, 2C39 VALVES (new), valves for most other broadcasting equipment, COAXIAL CABLE for TV distribution systems (new) with heavy copper sheath and very low-loss, MULTICORE cables including audio types (screened pair and screened quad). Many other items too numerous to list. Telephone 021 472 3688 or 021 446 4346. Fax: 021 446 4228 (I may have a photocopied list by the time this advert appears - please ask). Ken Bailey, 1435 Pershore Road, Stirchley, Birmingham, B30 2JL.

HITACHI GP7-K genlockable single-tube colour CAMERA with AP-60K PSU. C-mount but no lenses, two available...£100 each. KOWA f1.8 12.5-75mm C-mount ZOOM LENS...£35. FUJINON f1.8 17.5-105mm C-mount ZOOM LENS, as new!...£50. VEL MINIMIXER, two inputs, mixes, wipes and keys - with PSU...£75. JVC CV-AC224 POWER SUPPLY 13.2V/1.2A...£30. SONY CG-3CE SYNC GENERATOR...£25. CANON motorised ZOOM LENS with remote controller and some cables...£30. SONY VP-1230 U-matic PLAYER. PAL - NTSC - SECAM...£50. PANASONIC VHS EDIT system...offers. David Wilson 7 Massie Close Willen Park, Milton Keynes, MK15 9HG. Tel: 0908 665106

MONOCHROME PROCESSING AMPLIFIER, complete with power supply, in smart 19" rack mount case...£10. Buyer collect or pay carriage. Peter Delaney G8KZG, 6 East View Close, Wargrave, Berks. Tel: 073522 3121.

Electronic 8-input, 1 output VIDEO SWITCH. Ex-surveillance system, compact, keypad selection. Well-used but 100 per cent functionable...£11.50 including post & packing. Andy Emmerson, 71 Falcutt Way, Northampton, NN2 8PH. Tel: 0604 844130.

Sony CNW110E CAMERA VIDEO WIPER...£25. Shibaden closed circuit CAMERA HV405K...£45. Sony VIDEO CAMERA c/w viewfinder AVC3250CE and lens...£75. All are 625-lines and in good working order. Arthur Bevington G5KS. Tel: 021 552 4456 after 6pm or at weekends. MOS PAL COLOUR CAMERA c/w 6:1 power zoom and 1" EVF 10-pin VCR connector...£50. 30mm PLUMBICON YOKE...£2. New Mullard A47-14W CRT...£5. Used, tested 30mm PLUMBICONS, last chance...£2 each. Approx 24 LENSES - suit home made cameras, focal lengths 20mm-6". Not C-mount...£1n to £6 (SAE for list). All items plus postage at cost. Trevor Lumb, 2 Briarwood Avenue, Bury St. Edmonds, Suffolk, IP33 3QF. Tel: 0284 754318.

MONOSCOPE TEST CARD GENERATOR, French, superb performance c/w spare tube...£60. Link Electronics PAL CODER (similar to BBC GEM/526...£18. Pye NTSC CODER...£15. EMI 772 COLOUR STABILISING AMPLIFIER...£12. BBC UNI/525 PROCESSING AMPLIFIER...£10. EMI 9000 series CAPTION CAMERA, suitable 405/525/625, Camera Head/Cable/CCU/Tube...£25. Jeffrey Borin Tel: 01 863 2880.

## EXCHANGE & WANTED

SATELLITE TV GEAR WANTED FOR ASTRA/INTELSAT/EUTELSAT. I require a dish (60CM or larger), dish mount with AZ/EL adjustments, LNB and feedhorn preferably with polarity adjust. Usual 900 - 1500MHz IF required. W.H.Y. exchange for Bird Thruline Wattmeter (see ad in 'For Sale' section). John Wood G3YQC, 47 Crick Road, Hillmorton, Rugby, CV21 4DU. Tel: Kenilworth 512358 or Rugby (0788) 69447.

BAYONET LOCK CONNECTORS known as UK pattern 105, or series 62GB (Amphenol), or MIL-C-26482 or Series KPT (Cannon). Used on JVC cameras and extensively by the BBC. Shell size 16 with 26-pins, marked 16-26. Any items relating to IVC7000P CAMERA CHANNELS. Complete units or spares. Need circuits/handbook for 'BASE STATION' unit, also engineering control panel for use with base station. 1" PLUMBICON tubes for this camera type also required. Richard Harris, Eastview, 7 Fosse Lane, Shepton Mallet, Somerset, BA4 4PW. Tel: 0749 3876.

MURPHY V789 or V783 monochrome TV. PHILIPS N1515 VCR. (Pye) LEN BRIGGS 'Service Know How'. Any TV manufacturers SERVICE BULLETINS. GRUNDIG Video 2x8 (2080). PHILIPS N1500 series head-drum. Dave Hazell, 159 Queen Emmas Dyke, Witney, Oxfordshire, OX8 7EU. Tel: 0993 771373.

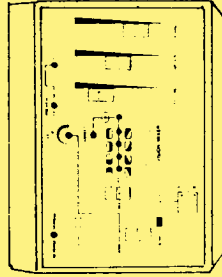
REQUIRED, interconnecting cable for HP431C RF POWER METER. Fred Smith, 5 Pinfold Crescent, Penn, Wolverhampton, WV4 4ET. Tel: 0902 343746.

OLD CAMERA TUBES (and similar imaging devices) of various type and age, and related data etc, for historic (!) collection. Particularly welcome would be an Orthicon, an Image Isocon or a 1.5" Vidicon. Tubes that are not operable are suitable, so if you replace tubes in cameras, don't throw the old ones away, but please contact Peter Delaney G8KZG, 6 East View Close, Wargrave, Berks. Tel: 073522 3121.

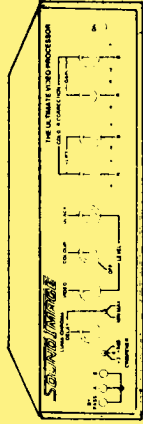
Old C-MOUNT LENSES (not Japanese) to swap or buy, also an early callsign generator of the type which used real diodes in a matrix. Did anyone build Dave Lawton's design, for instance? Andy Emmerson G8PTH, 71 Falcutt Way, Northampton, NN2 8PH. Tel: 0604-844130.

# THE SOUNDIMAGE RANGE

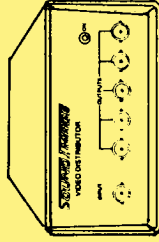
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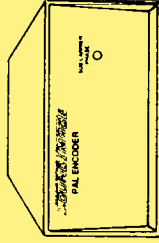
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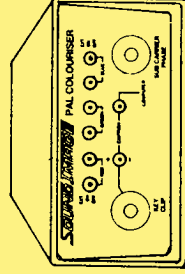
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